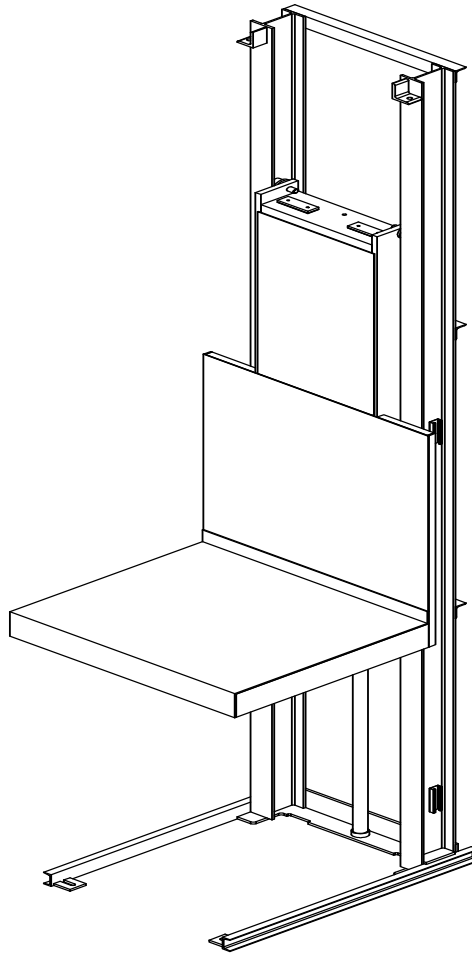


INSTALLATION, OPERATION AND SERVICE MANUAL

FREIGHTLIFT

Model FLT



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Item # 830FLT

Version 2.0
March 2008

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IMPORTANT

Please read and understand this manual prior to operation of the FREIGHTLITE. Failure to do so could lead to property damage and/or serious personal injury. If any questions should arise, call a local representative or *Autoquip Corporation* at 1-888-811-9876 or 405-282-5200.

PLANNED MAINTENANCE PROGRAM

A local *Autoquip* representative provides a Planned Maintenance Program (PMP) for this equipment using factory-trained personnel. Call a local representative or *Autoquip Corporation* at 1-888-811-9876 or 405-282-5200 for more information.

INTRODUCTION

Autoquip Corporation has manufactured the FREIGHTLITE. It has been designed to move lightweight materials between multiple floors or levels safely and efficiently. It has been built to provide many years of dependable service. Proper installation of this equipment is vital to both the efficiency of the unit and the ultimate satisfaction of the end user. **It is vital for the installers to read and understand this manual!** These instructions have been prepared and organized to assist the installers and it is important for these individuals to carefully follow the steps in the order they are presented!

Situations may arise which are not covered in these installation instructions. If you have questions, please call *Autoquip* Customer Service at (405) 282-5200 or 1-888-811-9876.

NOTE: Unless otherwise stated, mechanical installation does not include unloading, permits, seismic calculations, or extensive acceptance testing. The requirements of each contract should be carefully reviewed for possible conflicts of interpretation.

INSPECTION & IDENTIFICATION

The following items are typically shipped loose within each FREIGHTLITE order:

- A. One platform/mast beam/cylinder pair assembly
- B. One upper mast pair assembly (spliced masts)
- C. One hydraulic power unit
- D. One hydraulic connecting hose
- E. Limit switch kits
- F. One motor control panel
- G. One operator pushbutton control per level
- H. Miscellaneous Hardware, Manuals, and Signs
- I. Miscellaneous Bracing & Guarding – depending on application

NOTE: The “Bill of Lading” will state the number of pieces shipped. TWO ITEMS MAY BE BANDED TOGETHER AND COUNT AS ONE PIECE.

Upon receipt of the shipment, check for exposed damage or shortages and make note of it on the trucking company Bill of Lading or the Shipping Papers. Reports of concealed damage to items contained in crates must be reported within 48 hours. DO NOT destroy the crating while opening it to inspect the contents. If damage is suspected or found, report it directly to the carrier. DO NOT contact *Autoquip Corporation*!! All shipments are FOB from the Autoquip plant. **Any claims for damage must be filed with the carrier. Any parts shipped from *Autoquip* that are intended to replace damaged or lost items will be invoiced to the ordering party.**

Assuming no damage has occurred to the crate(s), check the components against the packing list. This will provide assurance that every item shipped has been received, report any shortages to *Autoquip Corporation* within 10 days. (*Autoquip* is not responsible for parts lost, stolen or damaged during transportation, storage, installation, or during any other circumstances that are beyond corporate control.)

RESPONSIBILITY OF OWNERS/USERS

CODE COMPLIANCE

Ultimate responsibility for gaining state and local code approval is the responsibility of the buyer of the VRC. Please acquaint yourself with the permitting and/or licensing expenses and requirements of the local regulatory agencies in the installation area.

INSPECTION & MAINTENANCE

The lift shall be inspected & maintained in proper working order in accordance with Autoquip's operating/maintenance (O&M) manual and with other applicable safe operating practices.

REMOVAL FROM SERVICE

Any lift not in safe operating condition such as, but not limited to, excessive leakage, missing rollers, pins, or fasteners, any bent or cracked structural members, cut or frayed electric, hydraulic, or pneumatic lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to the original manufacturer's standards.

REPAIRS

All repairs shall be made by qualified personnel in conformance with Autoquip's instructions.

OPERATORS

Only trained personnel and authorized personnel shall be permitted to operate the lift.

BEFORE OPERATION

Before using the lift, the operator shall have:

- Read and/or had explained, and understood, the manufacturer's operating instructions and safety rules.
- Inspected the lift for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a hazard. All items not in conformance with Autoquip's specification shall be corrected before further use of the lift.

DURING OPERATION

The lift shall only be used in accordance with Autoquip's O&M manual.

- Do not overload the lift.
- Ensure that all safety devices are operational and in place.

MODIFICATIONS OR ALTERATIONS

Modifications or alterations to industrial lifting equipment shall be made only with written permission of Autoquip. Autoquip does not foresee and does not anticipate unauthorized modifications, and these changes or alterations are grounds for voiding all warranties.

SAFETY SIGNAL WORDS

SAFETY ALERTS (Required Reading!)

The following SAFETY ALERTS are intended to create awareness of owners, operators, and maintenance personnel of the potential safety hazards and the steps that must be taken to avoid accidents. These same alerts are inserted throughout this manual to identify specific hazards that may endanger uninformed personnel. Identification of every conceivable hazardous situation is impossible. Therefore, all personnel have the responsibility to diligently exercise safe practices whenever exposed to this equipment.



DANGER!

Identifies a hazardous situation which, if not avoided, will result in death or severe personal injury.



WARNING!

Identifies a hazardous situation which, if not avoided, could result in death or serious personal injury.



CAUTION!

Identifies a hazardous situation which, if not avoided, may result in minor or moderate personal injury.

NOTICE

Indicates a potentially hazardous situation which, if not avoided, may result in property or equipment damage.

SAFETY PRACTICES



DANGER!

High voltage! May cause personal injury or death. Repairs should only be performed by a qualified service/control technician!!



DANGER!

Never go under a platform! To avoid personal injury or death, always be sure the load has been removed from the platform and that it has been blocked from underneath! See “Blocking Instructions” section.



DANGER!

Qualified personnel only!! Only qualified service personnel should perform procedures labeled as “dangerous”!



DANGER!

Be sure of equipment stability! To avoid personal injury or death, check for stability. If the unit seems unstable, do not operate! Contact *Autoquip* immediately!



DANGER!

Turn off power! To avoid personal injury or death, be sure the power is off and is locked per OSHA Lock-out, Tag-out procedures!

SAFETY PRACTICES



DANGER!

Practice field safety procedures! To avoid personal injury or death, utilize all applicable precautions for steel erection and equipment assembly in addition to OSHA regulations for lock-out, tag-out, etc.!



DANGER!

Secure platform and cylinders! Do not remove or disconnect the power unit unless the platform and cylinders have been secured. See “Blocking Instructions” section.



WARNING!

No riders! The FREIGHTLITE is provided for the sole purpose of transporting goods between floor elevations. At no time should it be used to transport personnel!!



WARNING!

Never run the unit with the gates or doors open! Do not operate unit with doors open or with the interlocks or other safety devices “defeated” (bypassed)! Serious injury or death could result.



WARNING!

Velocity fuse lock-up requires factory help! Contact your local FREIGHTLITE representative or call Autoquip Service Department if hydraulic velocity fuses should lock up!

SAFETY PRACTICES



WARNING!

Secure unit before making static inspections! Make sure the platform is fully lowered and the power is turned off (disconnected at the safety disconnect switch) before performing static inspections. Place signs at all gates, doors, controls, etc. indicating the system is temporarily out of service for routine maintenance per OSHA requirements for Lock-Out, Tag-Out.



WARNING!

Never operate unit when parts are defective! Do not operate this equipment when substandard or defective parts are in use! Contact an Autoquip Service Representative to rectify all such situations.



WARNING!

Never go under platform carriage! Use a long-handled broom or similar implement to remove debris that may accumulate.



WARNING!

Use properly rated hoses only! Never use fittings or hoses that are not properly rated for the intended use.



WARNING!

Attach velocity fuse with solid fitting! Do not use a swivel fitting between the velocity fuse and cylinder. If accidentally broken at the swivel, the velocity fuse will not prevent the carriage from falling to the floor.

SAFETY PRACTICES



WARNING!

The velocity fuse (VF) must be properly installed! The VF is attached to the elbow fitting in the rod port of the cylinder. If the VF is installed improperly, it will not lock up in the event of a catastrophic hydraulic line break!



WARNING!

Do not over travel! Mechanical stops must be in place to prevent the carriage from over traveling, which could create a very dangerous condition!



CAUTION!

Do not run carriage until pressure switch is set! If the electrical work is not complete, do not run the carriage all the way to the top until the limits are set.

CAUTION!

Use appropriate fluids! Do not use automatic transmission fluid (ATF), hydraulic jack oil, hydraulic fluids, or brake fluids in the power unit or hosing system.

CAUTION!

Keep power unit filled! Do not run the hydraulic power unit dry. Damage to the pump and motor may result.

SAFETY PRACTICES

CAUTION!

Do not operate motor at relief pressure! The motor should not be operated for more than a few seconds when the unit is operating at relief pressure. Longer running times could result in damage to the pump.

CAUTION!

Automatic cylinder retraction possible! Be aware that the cylinder rod may retract into the cylinder body automatically when the hydraulic hose is disconnected.

CAUTION!

Avoid air in the system! The presence of air in the system can lead to a lock-up of the velocity fuses. (Air reacts like a spring when it is compressed.)

CAUTION!

Protect cylinder rods, hydraulic ports and lines at all times! Welding splatter and dust from grinding operations can cause severe damage to this equipment.

CAUTION!

Do not damage the pump or motor! If the motor needs to run during the installation process and the electrical work is not complete, only do so for a second or two after the mechanical stop is pressed. Longer activation could cause damage to the pump or the motor. If the electrical control system is complete, the motor will stop because of the pressure switch setting.

SAFETY FEATURES

There are several active safety features and devices to help protect personnel, property, and the equipment.

ZERO DRIFT FEATURE

A zero drift feature has been incorporated into the FREIGHTLITE lift. The zero drift uses a limit switch mounted at the upper level and the pressure switch circuit. The limit switch is tripped closed when the carriage is at the upper level. The electrical circuit is transferred to the pressure switch, if the pressure switch closes due to a pressure drop or leak. The motor will start momentarily to build pressure until the pressure switch shuts the motor off. This keeps the platform from drifting downward from the upper level. When the operator closes all gates and energizes the down pushbutton, the zero drift circuit is disabled and the carriage will lower.

HYDRAULIC VELOCITY FUSES

Each hydraulic cylinder has a hydraulic velocity fuse (HVF) installed in the cylinder port. These HVFs are installed in the predetermined hydraulic oil flow velocity as the oil returns to the reservoir. They do not affect incoming oil. Should a catastrophic rupture or breach occur in the hydraulic system and oil flows through the breach that exceeds the HVF rating, the HVF will trigger and lock up. This lock up will occur with one to two inches of downward movement of the platform carriage.

NOTE: Air in the system will also cause a lock up. Air acts like a spring when compressed. To remove air from the system, see “Air Bleeding Procedures” in the General Maintenance section.

NOTE: Small fitting leaks will not trigger the HVFs. In an air-free system, the breach must be large enough to cause an uncontrolled or destructive lowering speed. Should a triggering and lock up occur, it can only be released by applying upward hydraulic flow in a functional system.

SAFETY FEATURES

SAFETY RELEASE BYPASS VALVE (SRBV)

The SRBV is a part of the hydraulic system. Should the system pressure exceed the predetermined pressure setting, the SRBV will bypass the pump output back to the oil reservoir. The SRBV is factory set to the proper pressure, which will prevent damage to the mechanical, hydraulic, and electrical systems due to overloading, obstruction, or other circumstances. This setting should be tested once installation is complete (see Installation section).

CONTROL TRANSFORMER SECONDARY FUSE

This fuse is attached to the electrical control transformer and protects the 115 volt control circuit from damage should a fault occur which would result in excessive electric current flow. Should the fuse activate (blow) it will prevent the operation in either direction and the interlock circuit will not operate. These fuses are located in the control enclosure.



DANGER!

High voltage! May cause personal injury or death. Repairs should only be performed by a qualified electrician or service technician and OSHA requirements for Lock-Out, Tag-Out must be followed!!

MOTOR STARTER OVERLOADS (MSO)

These are current sensing devices that are located in the three legs of the electric motor primary power circuit (208,230, or 460 volt). They protect the motor from excessive current draw if it becomes overloaded, experiences low line voltage, or has a short circuit. Should any leg sense an over-current situation the element will heat up and trip the heat sensitive device housed in the motor starter coil circuit. Power is removed to the coil and the three line power contacts are opened in the motor primary power circuit. This will stop the motor from rotating until the overloads are reset and/or the fault is cleared which caused the trip condition.

NOTE: The MSO will only affect the “UP” circuit. The platform carriage can be lowered if the MSO trips.

SAFETY FEATURES

SAFETY INTERLOCKS/LATCHES-GATES OR DOORS **(where applicable)**

These are electro/mechanical devices that prevent operation of the FREIGHTLITE when the gates or doors are left open on any level. They also prevent the gates or doors from being opened at any level unless the platform carriage is in place at that floor level.



WARNING!

Never run the unit with the gates or doors open! Do not operate unit with doors open or with the interlocks “defeated” (bypassed)!

SHAFTWAY DOOR BARRIER BARS (where applicable)

Shaftway door barrier bars are designed to provide a secondary means of personnel protection at the upper level landing of an FLT shaftway installation. When the carriage is not present at the upper level, the two barrier bars rest in permanent brackets attached to both sides of the door frame on the outside (shaft side) of the upper level door. The barrier bars form rigid barriers at approximately 24” and 48” above floor level. In the unlikely event that the upper level door is able to be opened when the carriage is not at the upper landing, the bars provide an additional means of personnel protection against stepping or backing into the shaftway where the carriage could be assumed to be present.

When properly installed, the barrier bars are lifted up and along their tracks by the carriage as it approaches the upper landing until it is completely above the load height as the lift stops. As the lift moves to the lower level, it carries the bars back to their stationary brackets attached to the outside of the door.



WARNING!

Shaftway door barrier bars are not intended to be used as a primary means of personnel protection. It is the responsibility of the operator to ensure that all gate/door interlocks have been installed and are functioning properly. Serious injury or death could result if upper level gates/doors can be opened when the lift is not present at that level.

SAFETY FEATURES

PERSONNEL GUARDS

Depending on the application, one or more of the following personnel protection features is included in the design of this equipment (different states may vary on the exact design and orientation of these features – IT IS IMPORTANT TO BECOME FAMILIAR WITH THE SPECIFIC CODE REQUIREMENTS OF YOUR STATE):

- **GATES & ENCLOSURES**: Required per ASME B20.1 to protect personnel from inadvertent physical contact with a moving lift & moving load at all lift landings.
- **CARRIAGE RAILINGS & SNAP CHAINS**: Required per ASME B20.1 to protect personnel whenever personnel walk onto the lift carriage when in the raised position. Railings or side guards protect non-operating sides, snap chains protect operating sides.
- **CARRIAGE BACK-STOP PANELS**: Additional safety feature recommended at all upper levels to provide additional fixed guarding 2" (max.) away from & across all unused, operating sides of the lift (typical with non-shaftway "Z" & 90 degree load patterns).

LABEL IDENTIFICATION

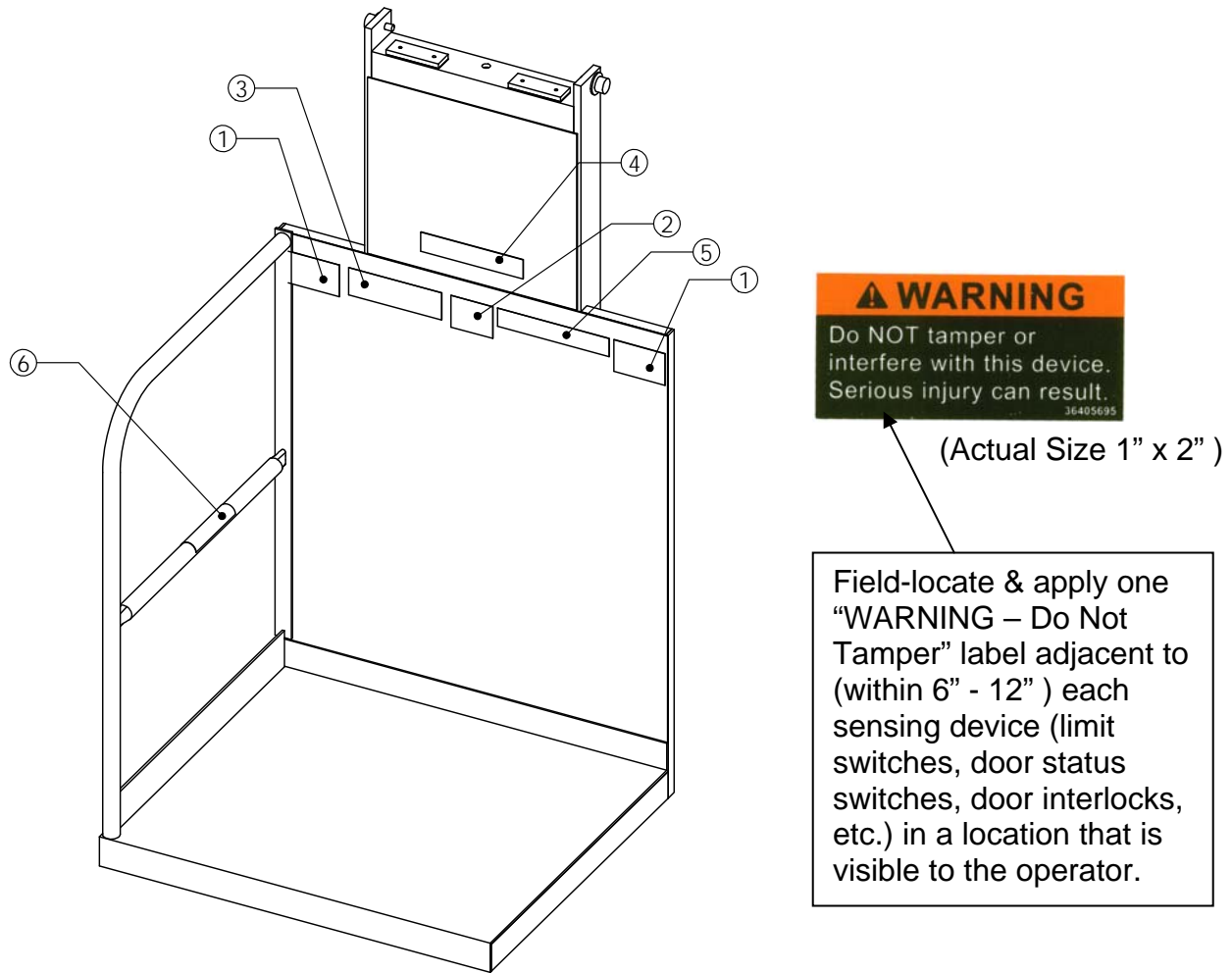


Figure 1 FREIGHTLITE Label Placement

FREIGHTLITE			
Item #	Qty.	Description	Part No.
1	2	Warning – No Riders	36404093
2	1	FREIGHTLIFT by Autoquip logo	36402680
3	1	Serial Number Nameplate	36401560
4	2	Capacity	36401586
5	2	Caution – Familiarize Yourself . . .	36401487
6	varies	Warning: Do Not Operate Without	36403720
7	(2) per P/B	P/B Labels – Warning Do Not Allow Riders	36405705

LABEL IDENTIFICATION

Note: Labels shown here are not actual size.



Figure 2 Label 36404093

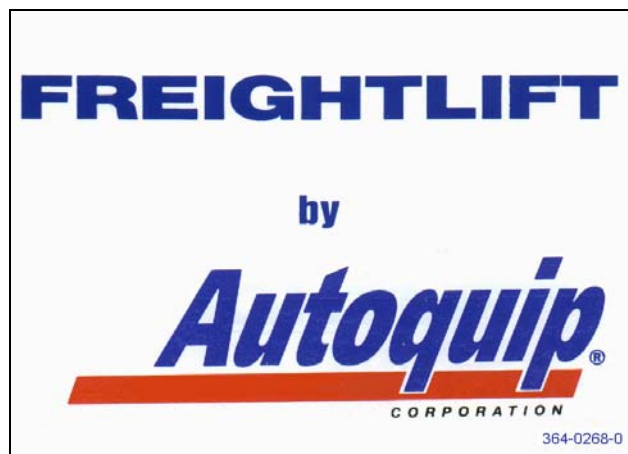


Figure 3 Label 36402680

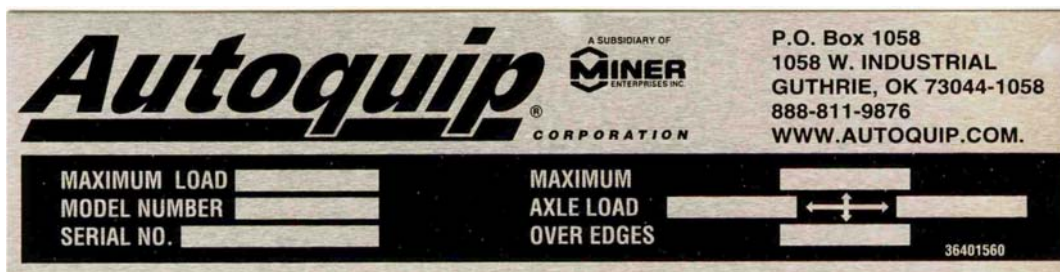


Figure 4 Label 36401560

LABEL IDENTIFICATION



Figure 5 Label 36401586



Figure 6 Label 36401487



Figure 7 Label 36403720



Figure 8 Label 36405705

SPECIFICATIONS

Model	Capacity (pounds)	Minimum Platform (feet.)	Maximum Platform (feet)	Speed (FPM)	Travel (feet)	HP
FLT-15	1,500	3 x 3	6 x 6	15	15	5
FLT-30	3,000	3 x 3	6 x 6	15	15	5



WARNING!

Do not make modifications to the lift without authorization from the manufacturer! Unauthorized and unforeseen carriage, lift structure, drive base or support bracing attachments added in the field could create an unsafe operating condition which could result in severe personal injury or death.

BLOCKING INSTRUCTIONS



WARNING !

Only authorized personnel should perform inspection or maintenance and service procedures. Unauthorized personnel attempting these procedures do so at the risk of personal injury or death.



DANGER !

Failure to properly adhere to lift blocking procedures is to risk the sudden and uncontrolled descent of the lift during maintenance or inspection. A falling lift can cause severe injury or death.

This procedure describes the only factory-approved method of working under a lift. Follow these instructions EVERY time you plan to reach or crawl beneath the lift to perform service or maintenance – no matter how momentary that might be.

If the factory-provided maintenance devices are damaged or missing, stop immediately and consult the factory for assistance. The manufacturer is not liable for your failure to use the approved maintenance devices and procedures that have been provided.

Lower the Lift Platform

The safest way to inspect or maintain a VRC unit is with the load removed and the lift carriage in the fully lowered position. When the carriage is fully lowered it has no potential to suddenly or unexpectedly shift or drop.

If the lift carriage cannot be lowered by gravity, secure the carriage at its stuck position before attempting to walk on or under the platform.



DANGER!

Never go under an unsupported platform! To avoid personal injury or death, always be sure the load has been removed from the platform and that it has been blocked adequately to prevent shifting or dropping unexpectedly !

BLOCKING INSTRUCTIONS

When the Lift Carriage Must be Raised

1. All loads must be removed from the lift platform prior to engaging the maintenance devices. These devices are designed to support an unloaded lift only. Failure to remove the load from the platform prior to blocking could cause the failure of the maintenance devices and allow the lift to fall unexpectedly.
2. Raise the carriage to the desired elevation.

If Operational: Press the UP button and then press the EMERGENCY STOP button when the desired height is reached

If Not Operational: Use a fork truck or other lifting device to raise the VRC carriage, taking care not to damage the carriage or lift actuator/drive.

3. Place maintenance leg across the mast channel as shown in **Figure 10**. Make sure the square tubing of the maintenance leg rests against the flange of the mast-beam.
4. Position the maintenance leg so that all of the alignment tabs fit over the flange of The mast beam as shown.

Note: You should not stand beneath the carriage while setting the maintenance device into position.



DANGER!

To avoid personal injury or death, check the stability of the supports. If there is any chance of the support tipping or otherwise not providing a safe and stable condition, do not go under the platform!

5. Lower the carriage platform onto the maintenance device.

If operational – either press the DOWN button or open the manual lowering valve until the platform lands onto, and is fully supported by, the maintenance device.

If NOT operational - Use a fork truck or other lifting device to lower the VRC platform onto the maintenance devices, taking care not to damage the carriage or lift actuator/drive. Make sure the platform is level when supported.

6. Re-check to ensure that the maintenance device is fully and properly engaged with the underside of the platform. If the maintenance device is not fully engaged the lift could fall unexpectedly, resulting in permanent damage to the device or the lift.

BLOCKING INSTRUCTIONS

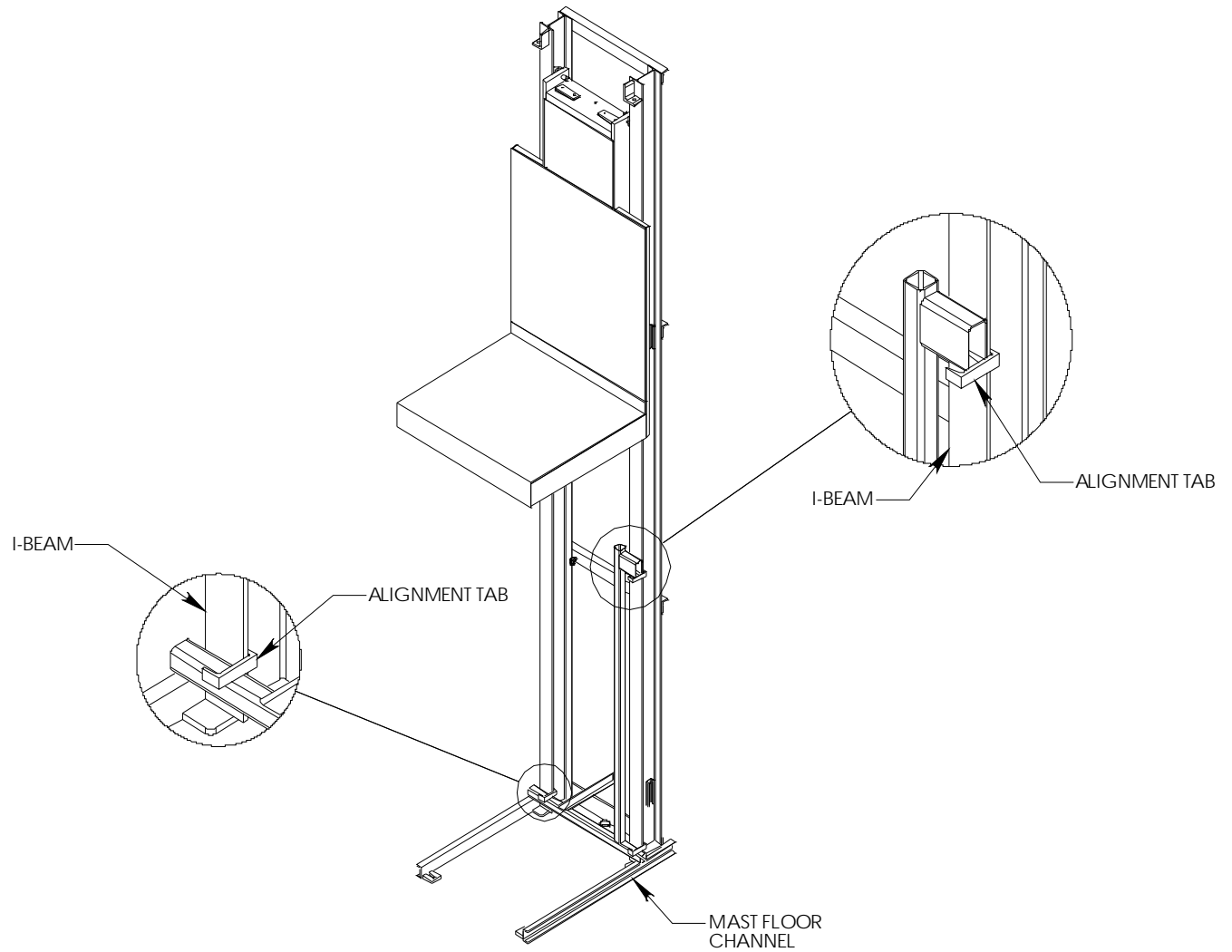


Figure 10 Maintenance Device Placement

BLOCKING INSTRUCTIONS

7. After the platform is fully lowered, continue to hold the DOWN button/lowering valve for an additional 5-10 seconds to relieve the hydraulic system of pressure.



WARNING !

Failure to relieve operating system pressure could result in the sudden and unexpected release of high-pressure fluids during maintenance and/or repair of the lift which may result in severe injury or death.

8. Follow OSHA electrical lock-out/tag-out procedures. Disconnect and tag all electrical and/or other power sources to prevent an unplanned or unexpected actuation of the lift.
9. Once inspection or work is complete, reverse the performance of the steps above to raise the platform off the maintenance devices and return the devices to their designated storage positions.



DANGER!

To avoid personal injury or death, turn off the power and lock out the power at the primary power disconnect switch before service or maintenance per OSHA Lock-Out, Tag-Out procedures.

INSTALLER GUIDELINES/RESPONSIBILITIES

Proper installation of Vertical Reciprocating Conveyors (VRCs) is vital to the safety of the operators, the efficiency of the unit, and the ultimate satisfaction of the end user. These guidelines have been prepared by member companies of the Material Handling Industry's VRC Subcommittee to assist the VRC installers in understanding their role and responsibility in providing customers with a safe and reliable VRC.

1. PRE-INSTALLATION ACTIVITY

- A. Whenever possible, make a pre-installation visit or call someone at the site. Installers must be familiar with everything relative to proper installation of this equipment. It is the installer's responsibility to check the site for problems and work out solutions with the appropriate people – preferably before installation begins.
- B. Check floor-to-floor dimensions on the general arrangement drawings to make sure that they match on-site conditions. VRC's are designed and built to individual applications and specific customer requirements. It is difficult and expensive to modify the lift after it arrives for installation.
- C. Installation may or may not include unloading, permits, seismic calculations, or extensive acceptance testing. The requirements of each contract should be carefully reviewed for possible conflicts of interpretation.
- D. Each state, county, or municipality may have unique codes governing the installation and acceptance of VRC's. Acquaint yourself with the permitting and/or licensing requirements (and expenses) of the local regulatory agencies. Note also that some agencies may require inspection or testing before and/or after lift start-up.
- E. Make sure there is adequate ingress/egress to the installation site. Verify that the equipment can get through the existing doorways, halls, and shaft openings. Think through how the lift will be unloaded, carted/moved, raised into position, and accessed for installation, operation & maintenance.
- F. Verify the construction and integrity of building columns, joists, walls, or mezzanines that will be used to help support the VRC mast guide beams.

2. SHIPMENT & INITIAL INSPECTION

- A. Upon receipt of the shipment, check for exposed damage or shortages and make note of it on receiving paperwork from the trucking company, any claims for damage must be filed with the carrier. Unless otherwise stated, the VRC Manufacturer is not responsible for parts lost, stolen or damaged during transportation, storage, or installation.

INSTALLER GUIDELINES/RESPONSIBILITIES

- B. Assuming no damage has occurred to the crate, check the components against the packing list. This will provide assurance that every item shipped has been received.
- C. Make sure you have a copy of the latest version of the general arrangement and electrical drawings before beginning installation, changes could have been made since original purchase order submittal and order entry.
- D. Read and understand the Installation & Service manual thoroughly prior to starting the installation.

3. EQUIPMENT LAYOUT

- A. Make sure pit and/or lift are properly squared and vertically aligned with upper landings to ensure that the carriage will clear the upper landings by the required distance.
- B. Be sure to take into consideration any other obstructions (pipes, ductwork, ceiling joists/beams, etc.) that may be located around the lift.
- C. Inspect the installation for any overhanging floor landing or other obstruction (pipes, ductwork, ceiling joists/beams, etc.) which could potentially jam a load that is slightly overhanging the carriage deck as it raises to the next floor level. Any potential jam point should have some type of slanted or beveled guarding placed beneath the obstruction to push the overhanging load back onto the carriage.

4. STRUCTURAL INSTALLATION

- A. Follow the bracing recommendations shown on the general arrangement drawings and in the Installation & Service manual. Site conditions may also require customization to standard anchoring and bracing. The installers are ultimately responsible for the proper and safe anchoring and bracing of the equipment and should consult the manufacturer if there is any doubt as to the structural integrity of the installation.
- B. When anchoring guide beams to walls, you must be sure that the walls can support the reaction loads imparted on them.
- C. If spliced masts are provided, be sure to assemble and field install them exactly to the Manufacturer's recommendations. Failure to do so will reduce the safety and performance of the VRC.
- D. Make sure guide beam pairs are plumb, parallel, and straight after you are finished with all welding.
- E. Do not modify any component of the lift without expressed written consent from the Manufacturer.

INSTALLER GUIDELINES/RESPONSIBILITIES

5. MECHANICAL INSTALLATION

- A. Most work can be done with the lift carriage fully lowered. Never work under the lift carriage unless it is blocked in place per the Installation and Service manual.
- B. Never allow a person to ride on the carriage of the lift.
- C. Use only the hardware supplied by the Manufacturer to assemble the lift. This hardware is often high grade, some hardware is metric.
- D. Use only the carriage lifting cables and attachment hardware supplied by the Manufacturer.

6. HYDRAULIC INSTALLATION

- A. Most work can be done with the lift carriage fully lowered. Never work under the lift carriage unless it is blocked in place per the Installation and Service manual.
- B. Never use Teflon tape on threaded connections. Teflon tape does not dissolve and, if introduced into hydraulic system, may contaminate the oil and cause valving to malfunction.
- C. Refer to Installation section for instructions as to how to properly adjust a relief valve setting. These are factory set to meet design and code requirements, but may need final adjustment once installation is complete.
- D. Carefully bleed all air out of the hydraulic system before running lift to full travel per Manufacturer's procedure in the Installation and Service manual.
- E. Make sure that the oil level in the reservoir is sufficient for running lift to full travel.
- F. Use only hydraulic fluid recommended by the Manufacturer in the Installation and Service manual.
- G. Make sure all pressure in the system is relieved before cracking open or disassembling any pressurized fitting or hose.

7. ELECTRICAL INSTALLATION

- A. Ensure that the supplied voltage matches the motor supplied.
- B. Make sure customer-supplied electrical disconnect is installed and adequately fused.

INSTALLER GUIDELINES/RESPONSIBILITIES

- C. All electrical work must meet the requirements of ASME B20.1 as well as all state and local codes.
- D. Make sure that only qualified electricians perform all wiring and that they are familiar with the electrical drawings shipped with the equipment.
- E. Do not operate the lift until the carriage is leveled and the guide beams are plumbed and secure.
- F. Never operate the lift by “manualling” the electrical controls (using the contactors located inside the control panel). All safety devices are by-passed in this mode of operation and lift damage or severe personal injury could result.
- G. Do not operate the lift using the operator pushbuttons prior to having all safety devices and/or gate interlocks wired and in the circuit. Never by-pass any safety device and/or interlock.
- H. Operator pushbutton stations must not be operable from the carriage with the gate(s) or door(s) closed, or must be located at least 6 feet away from the carriage platform.
- I. Per OSHA requirements, the control panel must be mounted in a location that is visible from the lift.
- J. Always follow OSHA lock-out, tag-out procedures when the lift being maintained, serviced, or inspected.

8. PERSONNEL & EQUIPMENT SAFETIES

- A. ASME B20.1 requires that all VRC installations be completely guarded to prevent injury from inadvertent contact with the lift or its load. ASME also requires that doors or gates at all unloading stations be interlocked so that these doors can only be opened when the lift carriage is stopped at that level & that the carriage is incapable of being operated or moved so long as these doors or gates remain open. It is the responsibility of the installer to ensure that the installation meet these requirements, regardless of who (manufacturer, customer, architect, general contractor, etc.) provides the doors/gates and means of enclosure. Consult the manufacturer whenever there is a question as to whether or not the gate & enclosure installation meets ASME B20.1.
- B. Where the application requires personnel to walk onto the carriage in the raised position, the installer must ensure that the carriage is adequately provided with railings, guards, and snap chains that are a minimum of 42” high.

INSTALLER GUIDELINES/RESPONSIBILITIES

- C. Travel limit switches must be installed and working properly.
- D. Ensure proper operation and engagement of motor and carriage brake assemblies.

9. TESTING

- A. Test up and down speeds.
- B. Test all limiting devices, gate interlocks, gate status switches, sensors, and any other safety features or devices as outlined by the Installation and Service manual.
- C. Some states or municipalities may require testing of the carriage free-fall arrest system (carriage brakes, slack chain/cable brakes, etc.) – consult the local regulatory agency or the manufacturer.

10. CLEAN-UP & HAND-OFF

- A. Ensure that all necessary adjustments to the interlocks, gate status switches, upper & lower lift status limit switches allow proper operation of the lift and its safeties per the manufacturer's requirements.
- B. Apply proper signage to all locations of the installation per the guidelines in the Installation and Service manual. Consult the manufacturer if labels appear to be missing or damaged.
- C. Clean up any spilled oil from the area.
- D. Train key personnel on the operation of the system and all safety features and procedures.

INSTALLATION INSTRUCTIONS

THE TOOLS REQUIRED FOR INSTALLATION

Listed below are some of the tools needed to install the FREIGHTLIFT in a professional and prompt manner. Individual site situations and a basic variation in the types of units may dictate the need for additional items.

Welding Machine and Equipment
Cutting Torch with Full Tanks
Fire Extinguisher
Forklift
Chain Fall
Come-A-Long
Cables or Hook Chains with 1,000# Cap.
Disk Grinder
"C" Clamps (12" opening)
Socket Set (1/2" drive, sockets to 1 1/8")
Pinch Bar
Hammer Drill & Bits for 1/4", 3/8" and 1/2" anchors

Hack Saw, Sawzall, or
Portable Band Saw
Drill and Drill Bits
Extension Cords
Sledge Hammer
Open or box end wrench
Drift Punch
Carpenter's Square
Chalk Line
Plumb Bobs
4' Level
25' Measuring Tape
Broom

The following supplies will also be needed:

*Concrete anchors (8 minimum) sized for the required minimum pullout of the base floor channels and upper level bracing. Refer to the approval drawing since the size of the anchors can vary for each installation.

*Concrete anchors for accessories, such as enclosures, approach ramps, etc. (Usually 1/4" diameter anchors and at least 12 anchors, minimum.)

*Shim stock for the floor channel, platform carriage corners, and/or approach ramp (if a part of this installation)

*Hydraulic oil (see oil recommendations and tank capacity in "Specifications" section)

*Paint (Autoquip Blue: available in 1 and 5 gallons)

*3" x 3" steel angle iron or 4" channel for additional bracing

ALSO - BEFORE YOU BEGIN :

1. Beams are too heavy to lift manually and require lifting equipment. Check for availability of overhead attachment of chain fall or of fork truck before you start.

2. Before you will be able to complete the installation the unit must be operated. Power to the motor (even if temporary) is required. Arrange for power before starting installation.

INSTALLATION INSTRUCTIONS

GENERAL

The FRIEIGHTLITE is shipped to the site factory assembled. However, the power unit, gates, and enclosures must be installed.

To install the FRIEIGHTLITE, refer to the General Arrangement (GA) or Record Drawings that have been shipped with the lift. These drawings have notes and measurements that should be checked before installation of the lift. The drawings will show how the lift should be arranged and how it should be installed specifically for this application. The installation may begin only after all of the measurements have been checked and are correct.

NOTE: All illustrations contained in this manual are for reference purposes only. Specific applications and site conditions may require different anchoring and bracing procedures. The ultimate responsibility for the anchoring and bracing rests with the installation crew.

A. LAYING OUT CARRIAGE POSITION & MARKING FLOORS FOR ALIGNMENT

1. Refer to **Figures 11-15** to lay out and mark the reference lines so that the lift will clear the upper landing and any obstructions that may be located around the lift (the General Arrangement Record Drawings should indicate the necessary clearance needed for the particular application).
 - a. **Figure 11** - Layout the position of the lift at the second level landing/opening, marking the center of the carriage first – then both outside edges of the carriage.
 - b. **Figures 12 & 13** - Drop a plumb line from the center marking of the carriage position at the second floor holding the plumb line one inch out from the edge of the landing (one inch is a standard distance for clearance - deviations may occur), or point A, down to the first floor and mark point B as the carriage center (check the GA drawing for any other special considerations).

NOTE: To ensure carriage clearance between floors, remove any protrusions from the floor, wall, etc., or move the plumb lines out beyond the protrusions.

- c. **Figure 14** - Drop plumb lines from the upper level to the lower level using the two markings identifying the outside edges of the carriage platform. Again, the plumb line must be held 1" out from the edge of the mezzanine or opening at the second floor to provide adequate clearance.
 - d. **Figure 15** - Using a chalk line, snap a line between C and D.

INSTALLATION INSTRUCTIONS

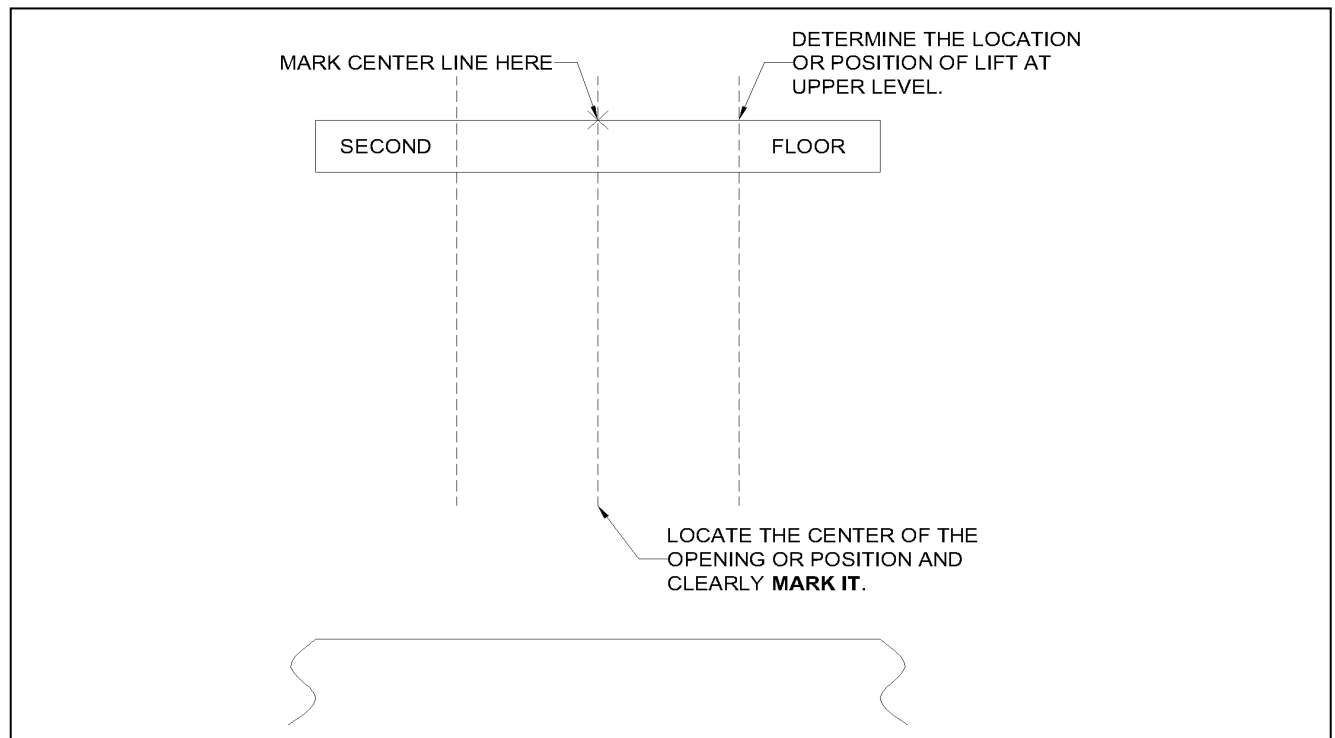


Figure 11 Marking the 2nd Floor for Carriage Position (Front View)

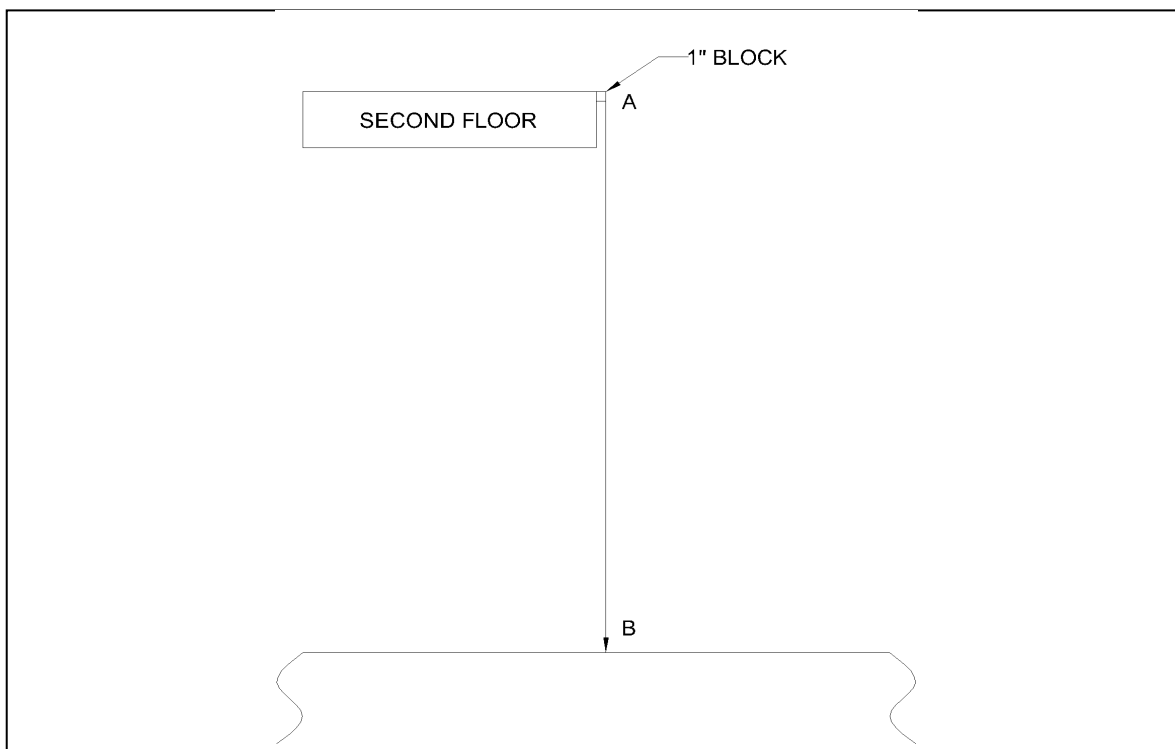


Figure 12 Locating Center of Carriage Edge on the First Floor (Side View)

INSTALLATION INSTRUCTIONS

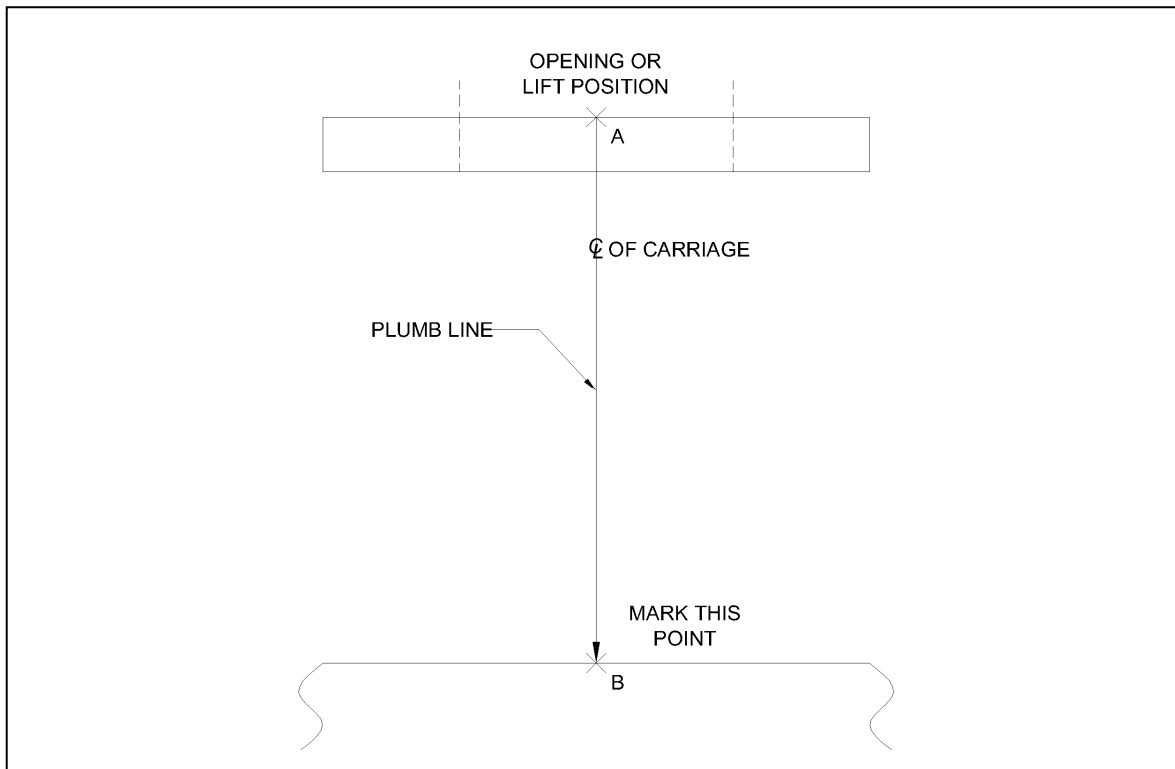


Figure 13 Locating Center of Carriage Edge on the First Floor (Front View)

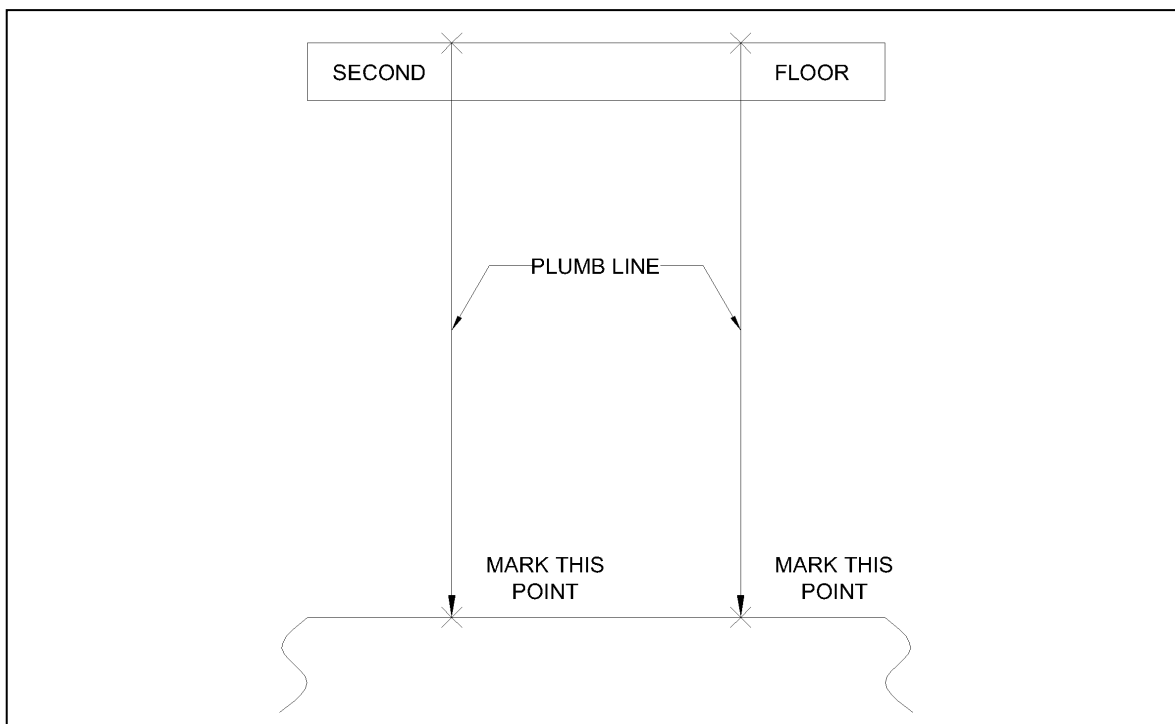


Figure 14 Locating Outside Edges of Carriage at the First Floor (Front View)

INSTALLATION INSTRUCTIONS

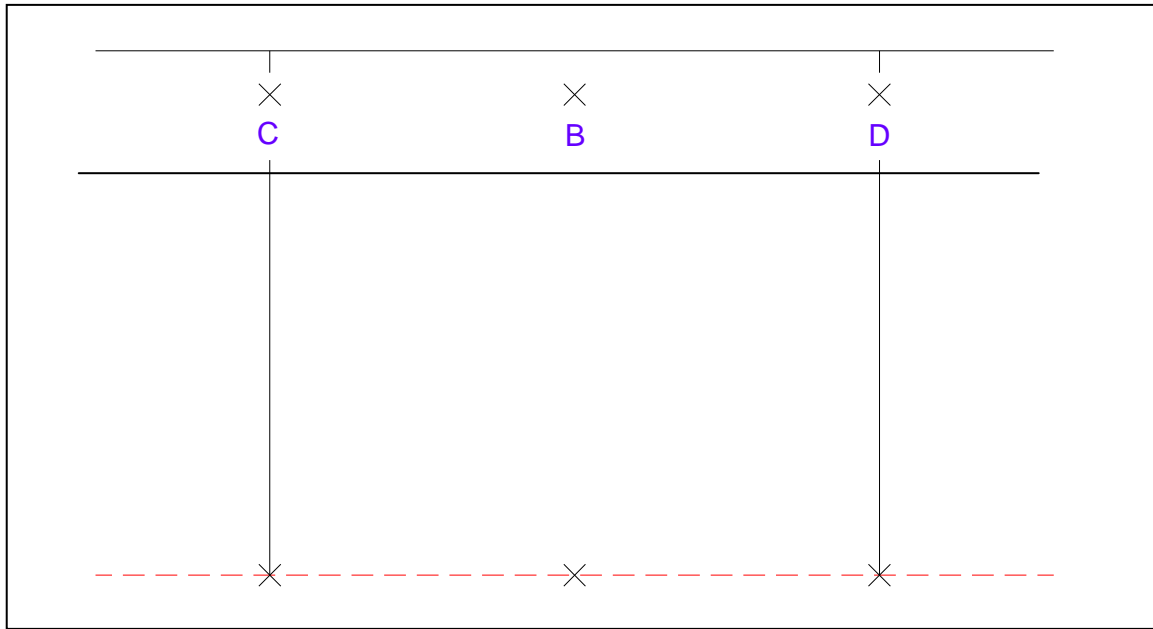


Figure 15 Chalking the Edge of the Carriage at the First Floor (Front View)

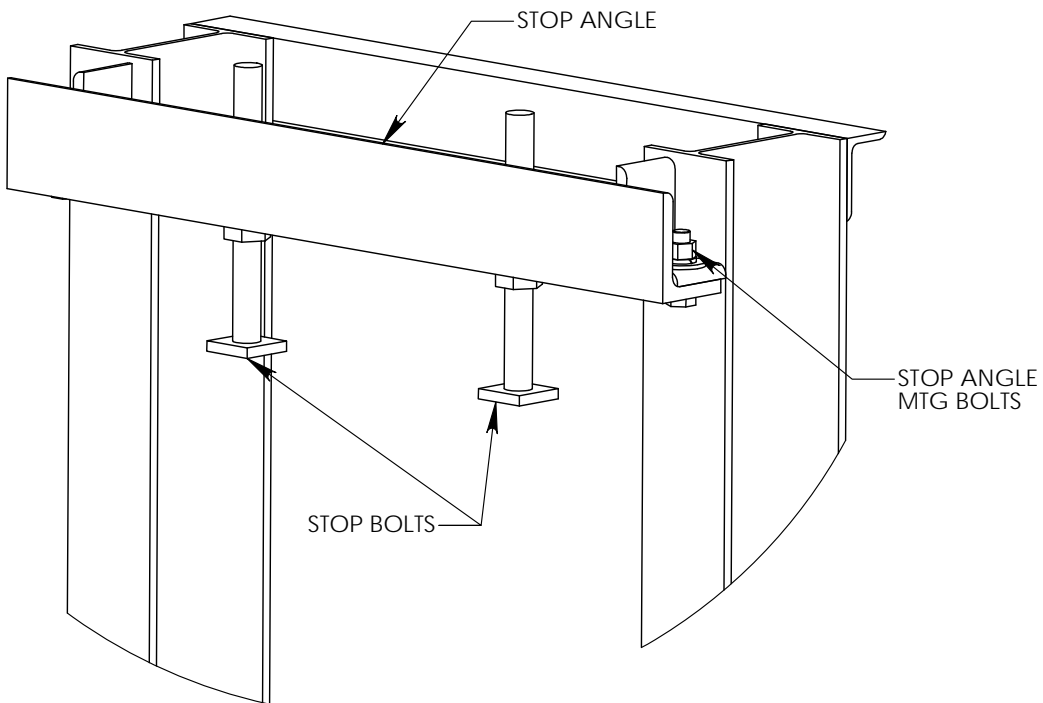


Figure 16 Stop Bolt Location

INSTALLATION INSTRUCTIONS

B. MECHANICAL INSTALLATION DETAILS

1. Install the top stop bolts that are provided into the stop angle located at the top of the mast pair (Reference **Figure 16**).
2. Stand the FREIGHTLITE up with the center of the carriage aligned with the "B" mark (Reference **Figure 15**) and align the carriage edge with the chalk mark made in the previous step. Use a chain fall from overhead beam or a fork truck to raise the mast pair and carriage into place (refer also to the General Arrangement Drawing).
3. For Pit Mounted Lifts - the pit has been poured 1/2" – 3/4" deeper than the total thickness of the carriage platform, therefore shimming material must be placed in the pit prior to setting the lift into place. Do not spot shim the base!
4. Once carriage alignment has been completed and all clearances confirmed with pit walls, floor openings, and/or other site-specific constraints, etc.), make sure the platform is level and the masts are plumbed and straight.
5. Connect a temporary power source.
6. Once the masts are adequately braced (see next section), it will be necessary to raise the carriage platform in order to lag the lift to the floor. The platform may be raised either manually (with a fork truck, chain fall from overhead beam or crane, come-along from the top stop angles, etc.) or powered hydraulically (refer to the following section "Hydraulic Installation").
7. Slowly raise the platform carriage to the upper level. Be sure that the necessary clearance is present.

CAUTION!

The pressure switch is not functional with temporary power! The power unit will continue to run as long as the contact button is pressed. Permanent damage to the lift may result if power to the electric motor is not shut off once the carriage makes contact with the stop bolts.

8. Complete the process of shimming the base of the lift. Do not spot shim the base! Begin by shimming the two lag holes at the back of the unit, and once the platform has been raised finish shimming and anchoring the two base frame tabs under the platform (Refer to **Figure 18** for anchor location detail).



DANGER!

Never go under a platform! To avoid personal injury or death, be sure the platform has been blocked from underneath! See "Blocking Instructions."

INSTALLATION INSTRUCTIONS

C. BRACING THE BEAMS

All illustrations on the GA drawing for bracing preferences are for reference only. Site conditions may require different anchoring and bracing. The installers are ultimately responsible for the proper and safe anchoring and bracing of the equipment. *Autoquip Corporation* supplies material for bracing on standard applications, but special bracing may be required by the installer on non-standard models. The special materials for anchoring and bracing of the lift and gates are not the responsibility of *Autoquip*.

NOTE: For all field welding of braces, use 1/4" fillet – all around.

Items needed:

<u>Qty</u>	<u>Description</u>
Varies	Horizontal Channel Braces
varies	Brace Plates – with (4) 9/16" dia. holes each

HORIZONTAL / UPPER LEVEL BRACING (Refer to **Figure 17**)

1. Attach the horizontal channel brace to the upper floor landings with either lags or by welding (it has been assumed that you will have a solid floor face to attach to for your installation). When attaching the floor to beam brace, use bolts which have been properly sized to withstand the horizontal pull-out force shown on the GA drawing.



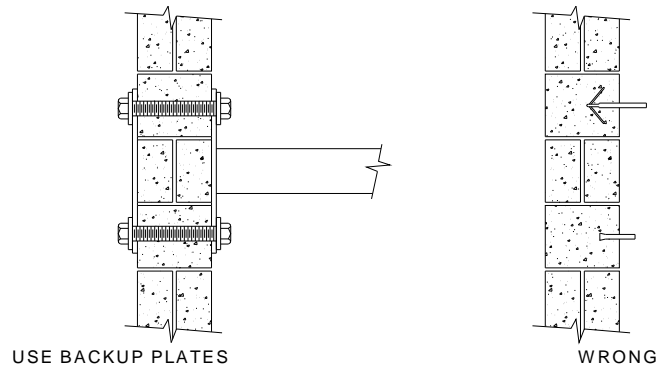
CAUTION!

Never use concrete anchor bolts on a cinderblock or brick wall! The wall will not withstand the pull force developed by the lift. Use only recommended anchoring and bracing methods illustrated in this manual. Equipment damage or personal injury could result.

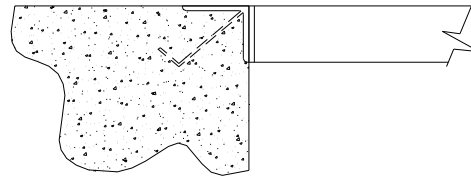
2. Add side bracing as necessary for your particular installation in order to prevent the beams from flexing or swaying sideways during operation.
3. Take necessary precautions to minimize beam movement resulting from the heating & cooling of welds. Re-check and confirm guide angle dimension.

INSTALLATION INSTRUCTIONS

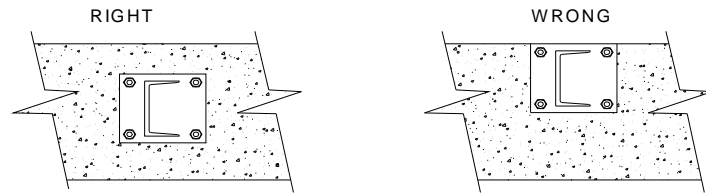
ANCHORING TO BLOCK WALLS



WELD TO CURB ANGLE



ANCHORING TO FACE OF FLOOR



WOODEN FLOORS

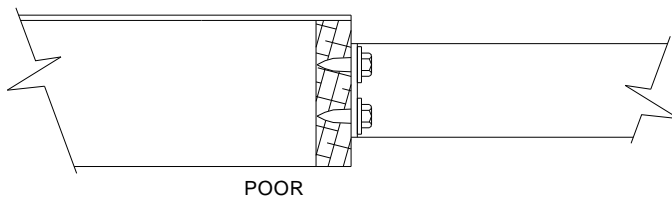
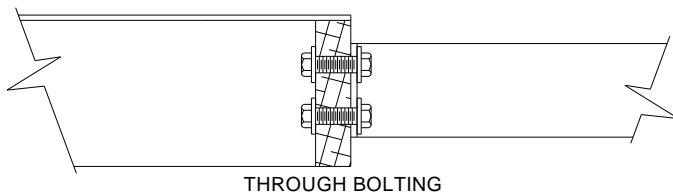
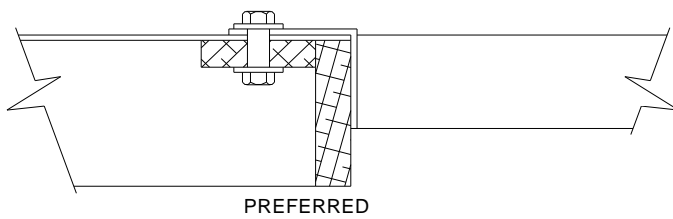
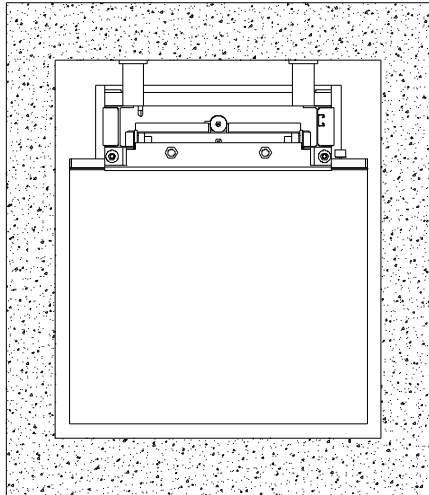
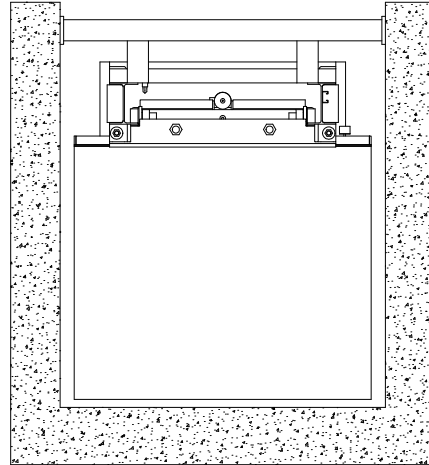


Figure 17 Approved Methods for Upper Level Mast Bracing

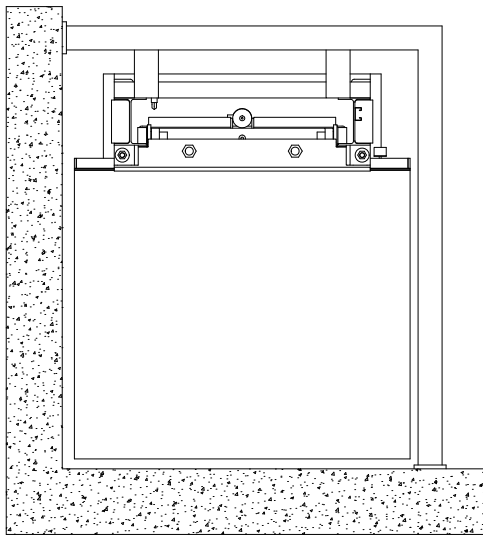
INSTALLATION INSTRUCTIONS



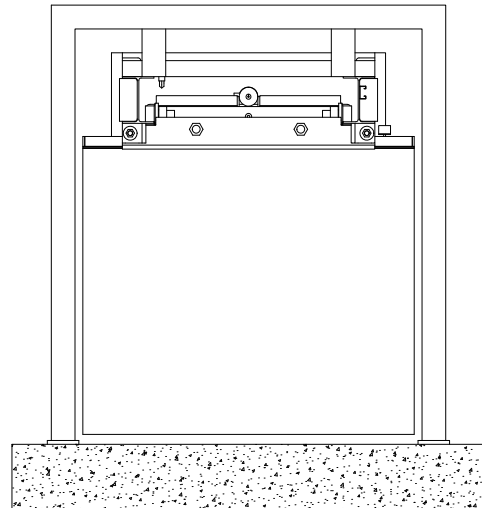
THROUGH A FLOOR



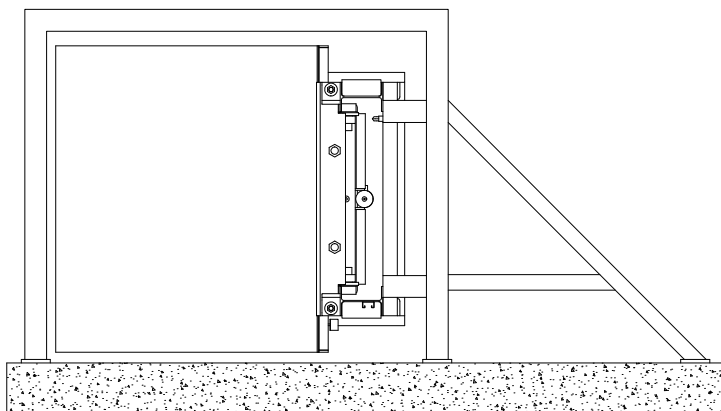
THROUGH A CUTOUT OR
OVERSIZED HOLE



IN A CORNER



FACING A MEZZANINE



ALONGSIDE A MEZZANINE

Figure 17 (cont'd) Bracing Configurations

INSTALLATION INSTRUCTIONS



WARNING!

Do not weld on the guide flanges of the masts. The field welding of any structural steel member into or across the guide beams in the path of the wheel guides is strictly forbidden. Interfering with the free travel of the wheel guides could create severe structural damage or cause the lifting chains to over-stress and fail resulting in permanent lift damage and/or severe injury to personnel

D. SPLICED BEAMS (when used)

1. Set the upper mast on its respective lower mast in the orientation shown on **Figure 19**, taking necessary precautions not to bend or damage transition plates.
2. Verify that the two mast beam pairs are true, straight, and plumb within 1/4" over the entire length of the beam. NOTE: This tolerance may not be exceeded or immediate & permanent damage to the cam followers will occur. (Shim material by installer).
3. Once both beams are verified to be straight & plumb within 1/4", permanently weld the upper & lower mast assemblies together as shown. Weld distortion to the beams must be minimized to hold the required tolerance to beam straightness.

NOTE: Care should be exercised not to distort the masts from welding, and alignment is critical. The flanged cam followers run on the front flange of the mast beams, and the cylinder stabilizing pads run on the inside of both mast beam. These areas must be ground smooth after welding the beams, failure to do so will cause the cam followers to fail prematurely.

NOTE: Beams must be plumb and parallel within 1/4" overall before proceeding with permanent bracing.

4. After you have completed the splice you may need to install extra bracing from the top section of the beam splice, back to the landing brace area. This will make the spliced section of beam stronger and prevent the welded area from flexing, which could cause the welds to fail.

INSTALLATION INSTRUCTIONS

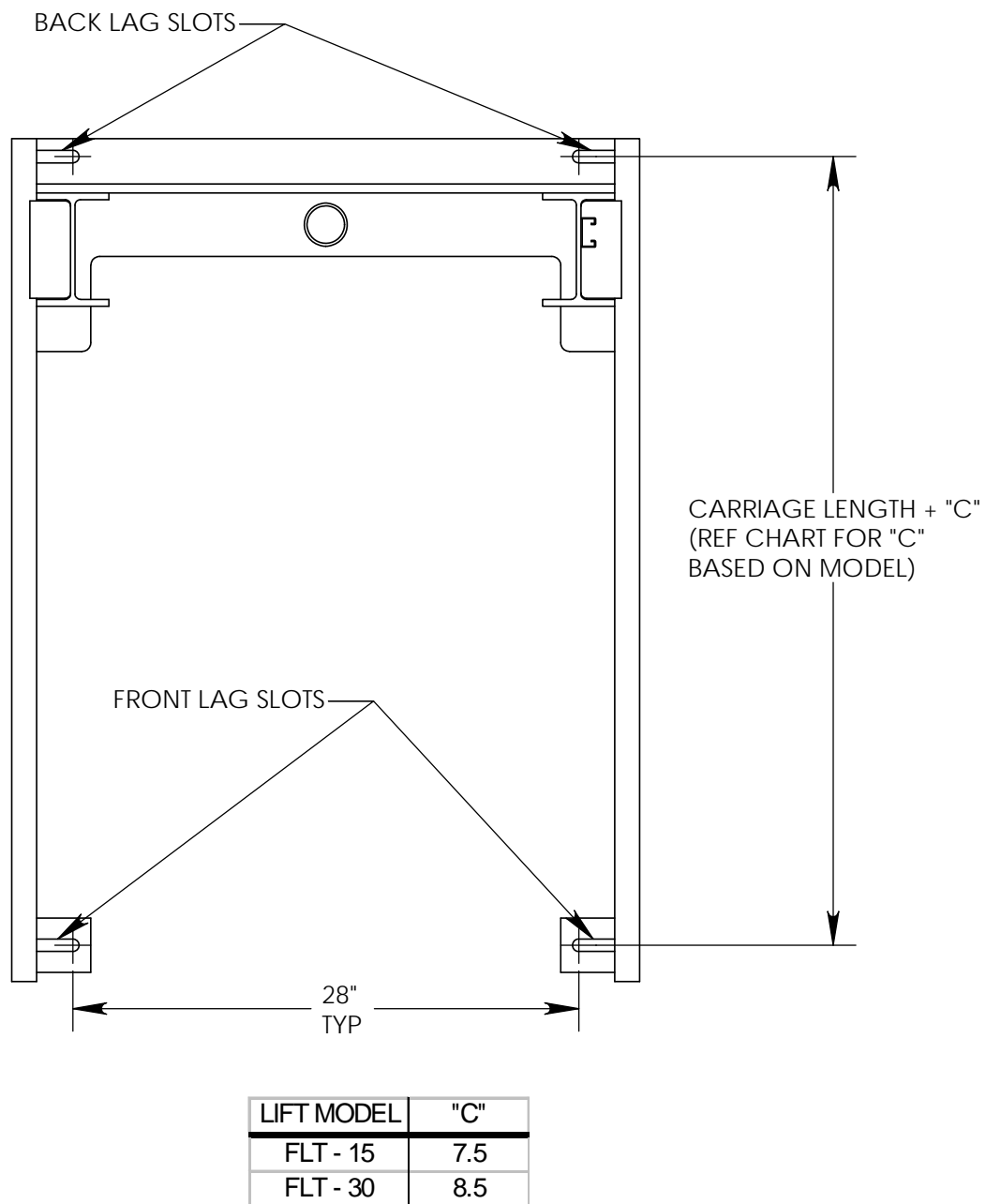


Figure 18 Lag-Down Location of Floor Channels (Top View)

INSTALLATION INSTRUCTIONS

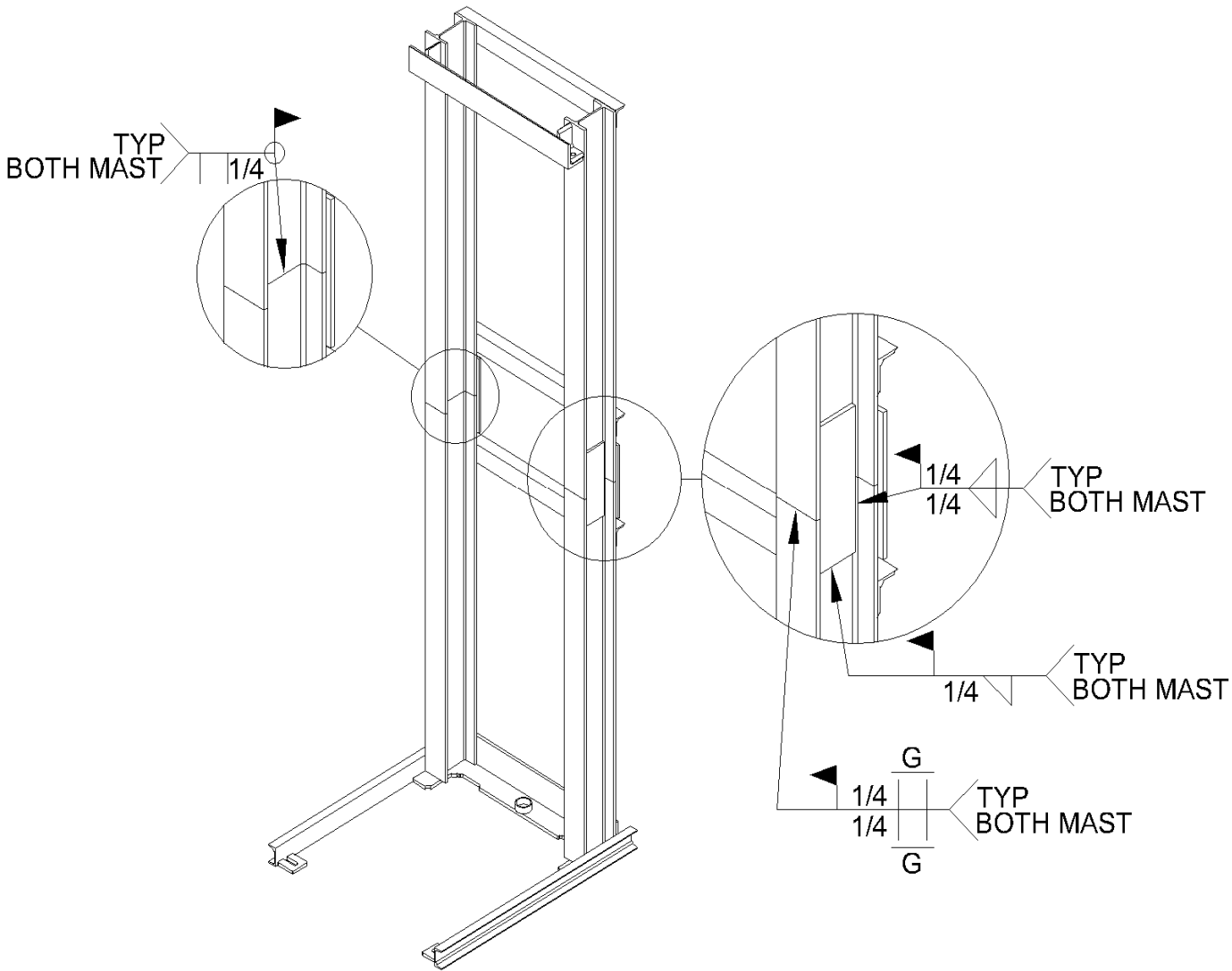


Figure 19 Mast Splice Field Welding

INSTALLATION INSTRUCTIONS

E. HYDRAULIC INSTALLATION DETAILS

1. Locate the power unit, preferably within 10 feet of the lift cylinders (the lift is supplied with a 10-foot connecting hose). The power unit can be mounted on the floor or on the wall, contact the *Autoquip* Customer Assurance department if special mounting brackets are required.
2. Fill the power unit with oil. Do not over fill! The oil level should be approximately 2" from the top of the tank (See "Oil Specifications" in the General Maintenance section). Wire in the power unit and remove any air from the hydraulic system.
3. Attach the hose from the power unit to the coupling on the back of the mast (Reference **Figure 20**).



WARNING!

Use properly rated hoses only! Never use fittings or hoses that are not properly rated for the intended use.

4. Connect electrical power to the power unit.
5. Remove any air from the hydraulic system per the "Bleeding Air from the System" instructions found in the General Maintenance section. Do not operate the lift yet!

CAUTION!

Purge air in the system! The presence of air in the system can lead to a lock-up of the velocity fuses. (Air reacts like a spring when it is compressed.)

6. Adjust the top stop bolts that are provided into the stop angle located at the top of the mast pair to make contact with the carriage overhead channel when in the fully raised position (Reference **Figure 16**).



WARNING!

Do not over travel! Mechanical stops must be in place to prevent the carriage from over traveling. Over-traveling can cause permanent damage to the carriage or failure of the lifting cables.

INSTALLATION INSTRUCTIONS

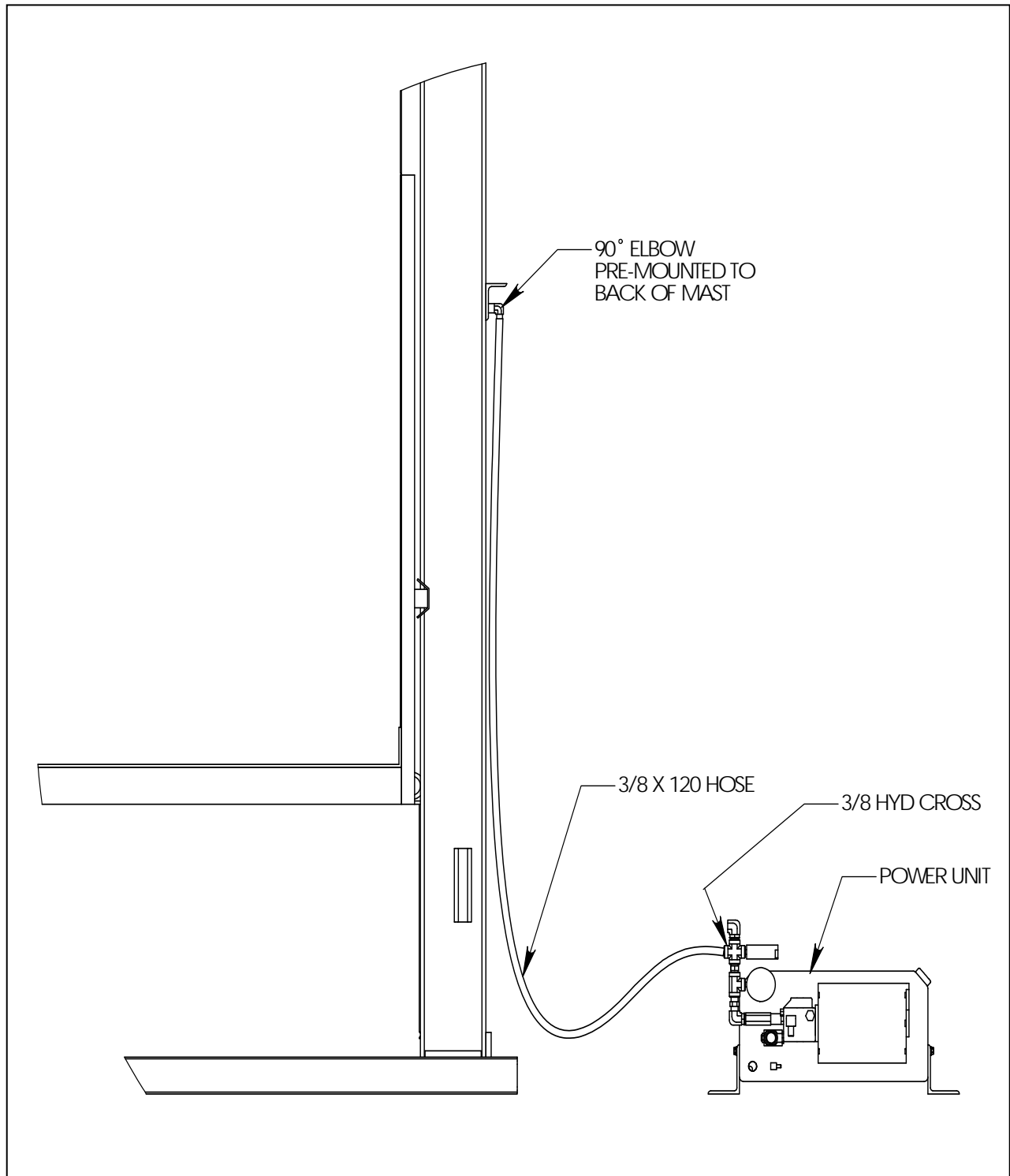


Figure 20 Hydraulic Hook-Up Detail

INSTALLATION INSTRUCTIONS

F. INSTALLING LEVEL/LIFT STATUS LIMIT SWITCHES

Items needed:

<u>Qty</u>	<u>Description</u>
Varies	1 N.O. – 1 N.C. Limit Switch Kits (depends on interlock style & Qty)
1	2 N.O. – 2 N.C. Limit Switch Kit
1	Maintained Contact Limit Switch Kit (for mid-level on 3-level applications only)

Level limit switch Kits (quantity depends on application – typically one (1) 2N.O.-2N.C. limit switch on second level, and (1) 1N.O.-1N.C. switch on first level (when equipped with solenoid interlocks), have been shipped loose to be field mounted, wired, and adjusted to sense the status/position of the lift carriage per **Figure 21**.

1. Locate, mount, and wire the level limit switches (shipped loose) on the adjustable Unistrut mounting plates located at upper and/or lower locations on the back of the mast pair. Again, depending on the types of interlocks used, there is either one or two switches to install.
2. Once assembled, adjust the limit switch arm to make contact with the limit switch cam when the carriage is at that corresponding level – leaving room for adjustment.
3. For best results in adjusting position of the switch, loosen the mounting bolts that hold the switch to the Unistrut channel just enough so that the switch can be lightly “tapped” into position. It is extremely difficult to loosen the bolts completely and adjust the switch.



DANGER!

Never go under a platform! To avoid personal injury or death, be sure the platform has been blocked from underneath! See “Blocking Instructions.”

INSTALLATION INSTRUCTIONS



(Actual Size 1" x 2")

Ensure one "WARNING – Do Not Tamper" label is adjacent to (within 6"-12") each sensing device (limit switches, door status switches, door interlocks, etc.) in a location that is visible to the operator.

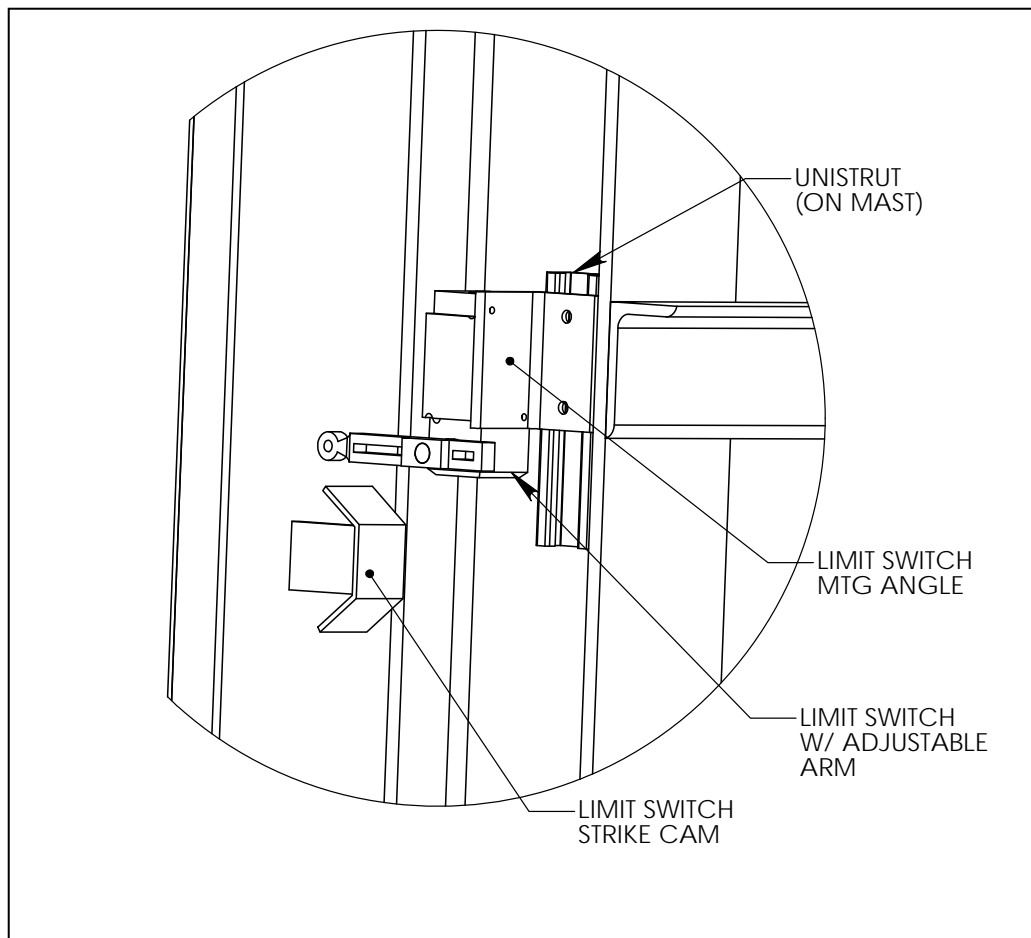


Figure 21 Level Limit Switch Mounting Detail

INSTALLATION INSTRUCTIONS

G. TEST RUN (EMPTY)



DANGER!

Never go under a platform! To avoid personal injury or death, be sure the platform has been blocked from underneath! See “Blocking Instructions.”

1. Bump the motor to check the rotation.
2. Turn on power and raise the Freightlift 6-12” (15-31cm).



CAUTION!

The pressure switch is not functional with temporary power! The power unit will continue to run as long as the contact button is pressed. Permanent damage to the lift may result if power to the electric motor is not shut off once the carriage makes contact with the stop bolts.



CAUTION!

Take extreme caution when running the unit before mechanical stops are installed and adjusted properly! Lift over-travel can cause severe damage.

3. Is the platform carriage level?
4. Activate the down push button and lower the lift. Is the platform carriage stopping square at the bottom level?
5. Raise the Freightlift 3-6 feet (.9m-1.83m) above the floor. Is everything okay? Any unusual noises? Are masts stable or do they need additional bracing?
6. If you are satisfied with the alignment and structural integrity of the unit, run the platform carriage higher, continuing to check the clearance and smoothness of operation.

INSTALLATION INSTRUCTIONS

7. Run the FREIGHTLIFT to the top floor and check the alignment of the platform carriage. Re-adjust the stops as necessary to achieve alignment with the upper floor. Be sure that at least 1" clearance is present between the carriage and all building structures, and other site constraints.
8. Adjust the top level limit switch to make contact with the carriage limit switch cam.
9. Lower the FREIGHTLIFT a few feet and raise it back to its full travel. Run it hard against the mechanical stops and check carriage alignment once more.

H. FINAL ADJUSTMENTS

1. Run the system through its paces if you have a complete electrical system.
2. To change the actuation direction of the limit switch, remove the switch head. Change the actuating control knob/mechanism to the desired actuation direction.

RELIEF VALVE SETTING

Though set at the factory, it is recommended that the pressure relief setting be checked prior to placing the unit in service.

3. Make sure top stop bolts and nuts are installed and tightened per instructions above.
4. Qualified electrician can temporarily place a jumper wire between terminal blocks 9 and 10 for testing the relief circuit.
5. Once placed, raise the lift carriage to full travel against the top stops. Pressure gauge reading should be 3200 psi (all air must have already been bled from the hydraulic circuit before this is done).

CAUTION!

Do not operate motor at relief pressure! The motor should not be operated for more than a few seconds when the unit is operating at relief pressure. Longer running times could result in damage to the pump.

6. If pressure does not read 3200 psi, adjust the relief valve setting per the steps shown in **Figure 22**.
7. After adjustment, check the setting one more time before removing the jumper from the motor control panel.
NOTE: This jumper MUST be removed from the circuit.

INSTALLATION INSTRUCTIONS



WARNING!

To avoid serious injury or death, **GUARDS, INTERLOCKS, SAFETY DEVICES and ELECTRICAL CIRCUIT** must be restored to correct operation when installing parts or making adjustments or repairs.

PRESSURE SWITCH SETTING

Though set at the factory, it is recommended that the pressure switch setting be checked prior to placing the unit in service to ensure that the power unit motor is turning off when the carriage reaches the fully raised position.

8. Make sure top stop bolts and nuts are installed and tightened per instructions above.
9. Raise the lift carriage to full travel against the top stops. Pressure gauge reading should be 2800 psi (all air must have already been bled from the hydraulic circuit before this is done).
10. If pressure does not read 2800 psi or the motor does not automatically shut off, cut off electrical power to the motor at the main disconnect.
11. Adjust the pressure switch setting per the steps shown in **Figure 23**.
12. After adjustment, reconnect power to the motor and raise the lift to the top stops again. If the pressure is at 2800 psi and the motor turns off, make sure pressure switch adjusting nut is locked in place.
13. Run the lift carriage full travel a few more times to ensure that the setting is correct.



DANGER!

To avoid personal injury or death, all maintenance procedures described in this section should only be performed by qualified service personnel.

INSTALLATION INSTRUCTIONS

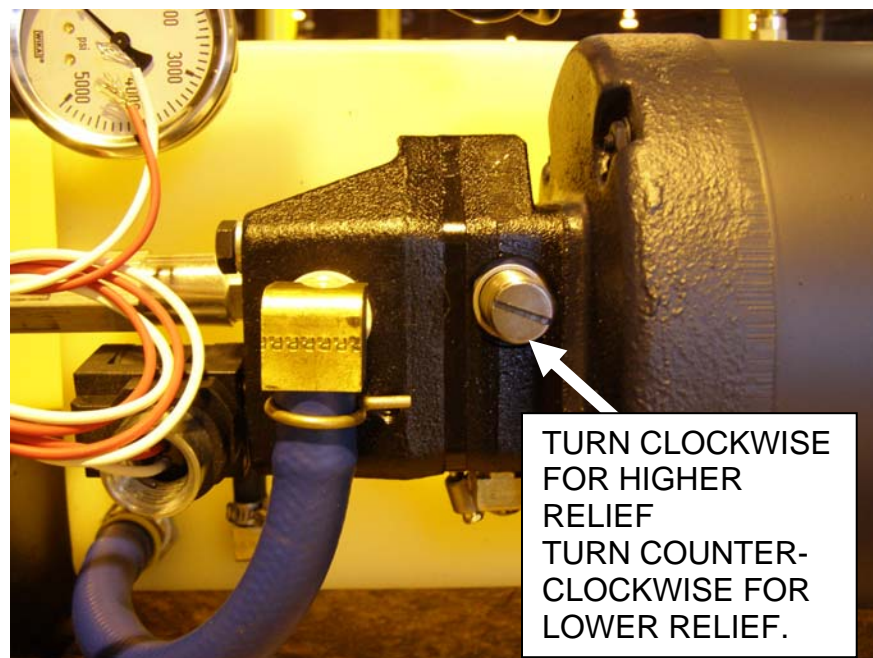
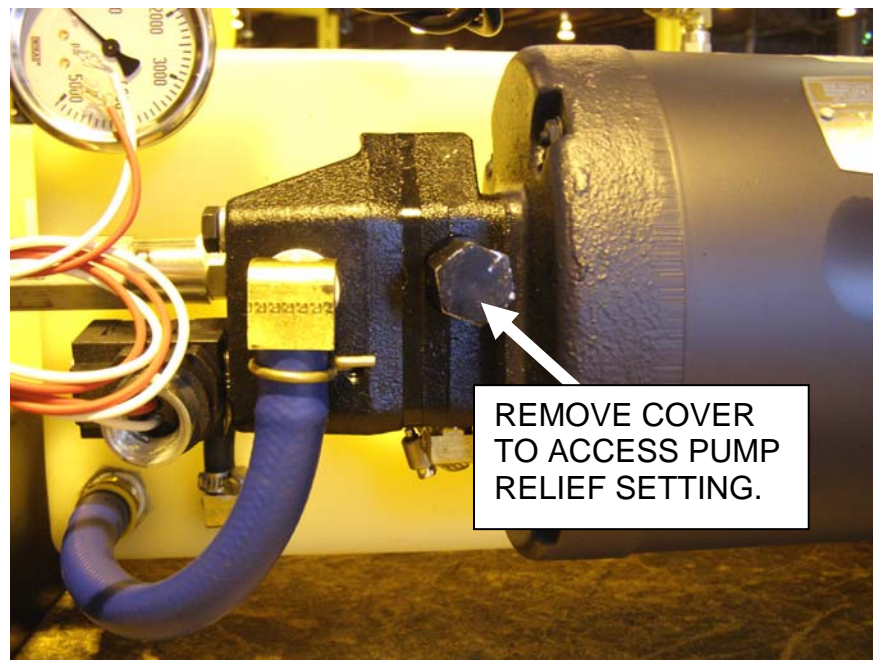


Figure 22 Pressure Relief Valve Adjustment

INSTALLATION INSTRUCTIONS

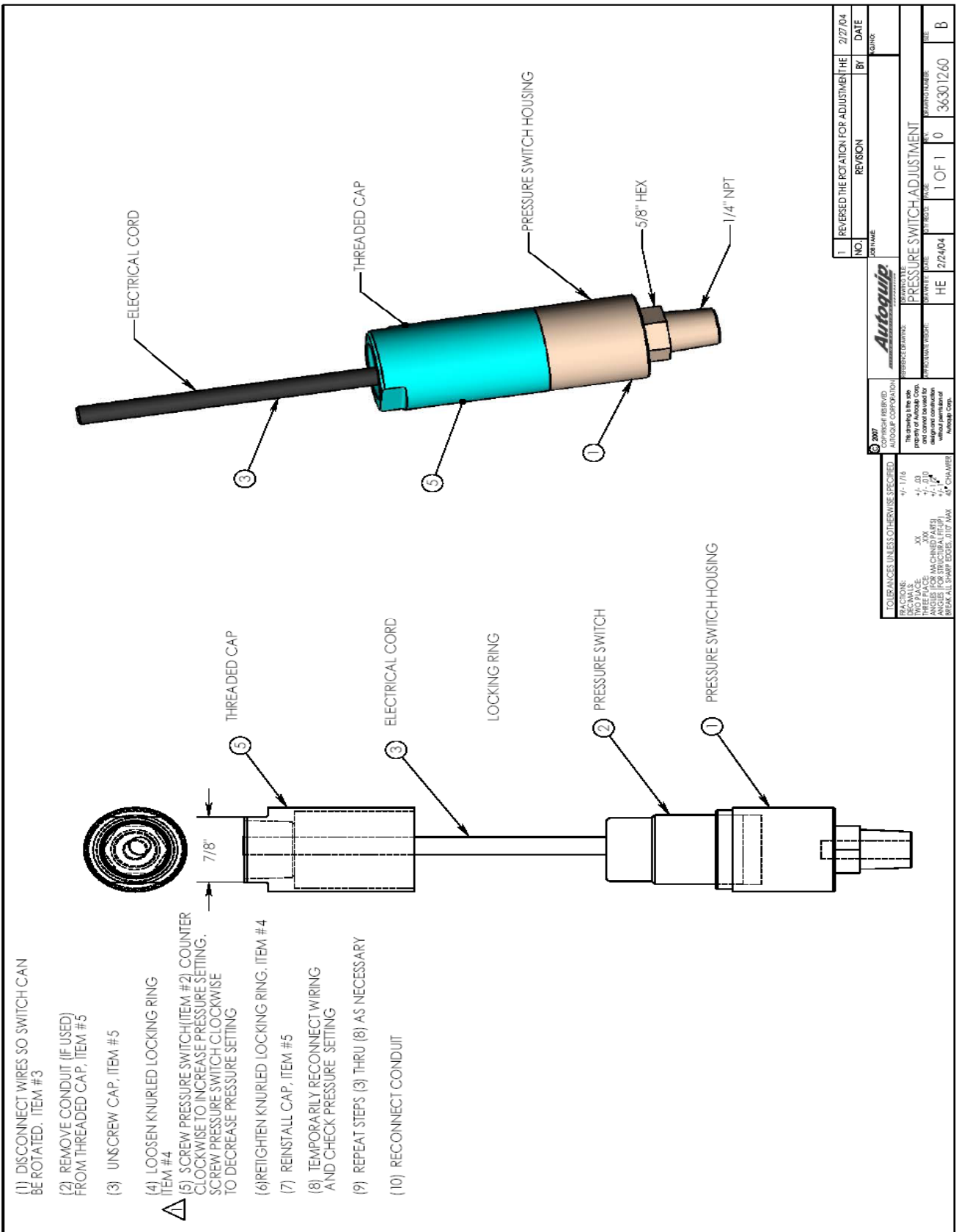


Figure 23 Pressure Switch Adjustment

INSTALLATION INSTRUCTIONS

I. PERMANENT ELECTRICAL INSTALLATION

A job-specific schematic has been shipped separately in a packet of information which includes this installation manual for reference by the electrical contractor or service provider. Refer to this schematic and follow all applicable NEC requirements throughout the electrical installation process.

Autoquip typically provides all the electrical control and signal devices. All required wire, conduit, and main disconnect for field wiring is supplied by others. Unless specifically included in the contract, the mounting and wiring of control and signal devices is the user's responsibility.

MAIN DISCONNECT: This should be a fused type disconnect which is to be located within ten (10) feet of the lift. THIS ITEM IS NOT SUPPLIED BY AUTOQUIP AND IS REQUIRED BY THE NEC (National Electrical Code.)

MAIN CONTROL PANEL: This panel is supplied and shipped loose by Autoquip, then mounted & wired by others. All electrical components will be tied into this panel.

HYDRAULIC POWER UNIT: Autoquip supplies the power unit shipped loose and recommends it be located adjacent to the unit. The power unit includes these electrical components to be field wired to the Control Panel: a motor, a pressure switch, and an electrical solenoid for the oil dump valve.

PUSH BUTTON STATIONS: Autoquip supplies one (1) P/B station for each level (under normal conditions). Stations are to be mounted by an electrician. The Safety Code (ANSI/ASME B20.1) dictates the position of these units to be, "remotely located so they cannot be activated while standing on the lift carriage."

LIFT STATUS LIMIT SWITCHES: Limit switches have been shipped loose to be field mounted, wired, and adjusted to sense the status/position of the lift carriage (lower level – for interlocks, upper level – for hydraulic re-pressurization circuit, and/or mid-level for 3-level applications). Refer to **Figure 21**.

OPTIONS AND ACCESSORIES: Items such as lift present lights, carriage lights, power gates, horns, etc, will all require electrical installation and will increase the installation time and the costs.

INSTALLATION INSTRUCTIONS

J. GATE & ENCLOSURE INSTALLATION

1. Install the gate and enclosures following the layout on the GA drawing provided with the enclosure package and referring to the Gate & Enclosure Installation Manual that has been sent separately for this particular application.
2. All gates or doors accessing the lift must have electrical contacts and mechanical locks to prevent the lift from operating if a gate is left open. The gate should lock until the carriage is at the nearest landing. There are many variables that can affect your installation: the type of gate; the type of door; conditions unique to a specific site. One (1) to four (4) electrical sensing or signaling devices are supplied with each gate that incorporates the standard interlock design.

K. SHAFTWAY BARRIER BAR KIT (for shaftway applications)

Figure 24 illustrates the contents and installation details for the shaftway barrier bar system supplied for units in shaftway applications. The barrier bar system is designed to leave (1) mid and (1) top rail across the door opening at the upper level when the carriage is called to the lower level.

L. BACK-STOP KIT (when ordered)

Figure 25 illustrates the contents and installation details for the back-stop kit. Installer must ensure that the finished distance between the edge of carriage and the inside of the back-stop panels does not exceed 2 inches.

M. INSTALLATION WRAP-UP

1. After the unit is completely wired, make all necessary adjustments to the interlocks, gate status switches, upper & lower lift status limit switches, and to the top stop bolts to ensure proper operation of the lift and its safeties as required by the schematic.
2. Ensure that all WARNING SIGNS AND DECALS provided with the unit which may have been shipped loose for field installation (gate panel, etc.) are in place. Refer again to **Figure 1**.
3. Clean up the area, paint and touch as needed.
4. Ensure that the appropriate person signs off on the Warranty Registration Card and receives one Owner's Manual per lift.

INSTALLATION INSTRUCTIONS

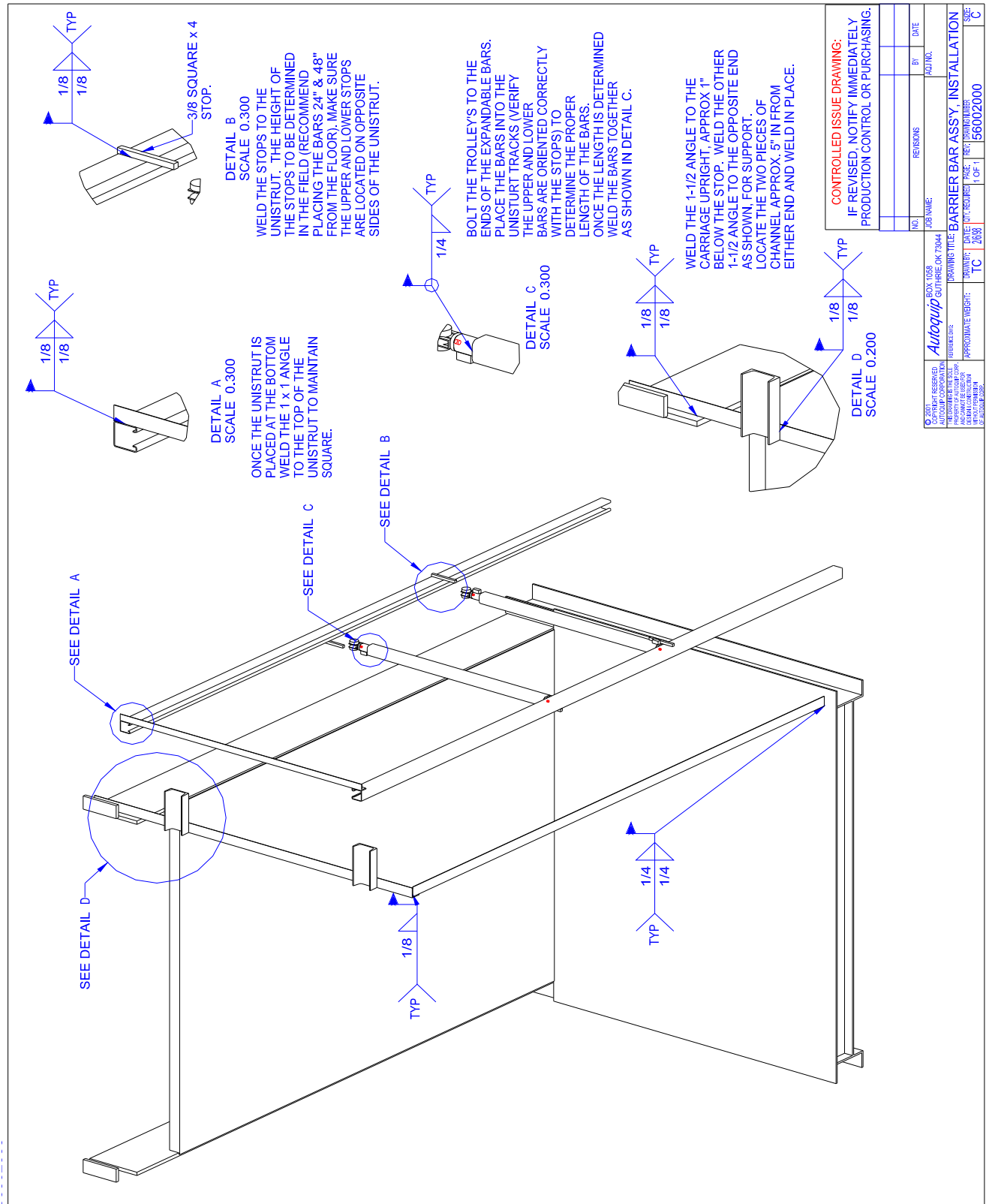


Figure 24 Barrier Bar Installation Details (when required)

INSTALLATION INSTRUCTIONS

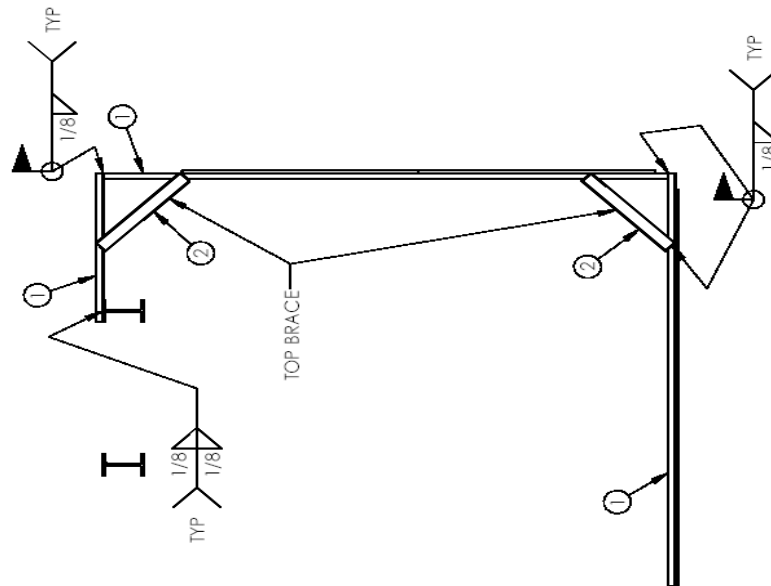
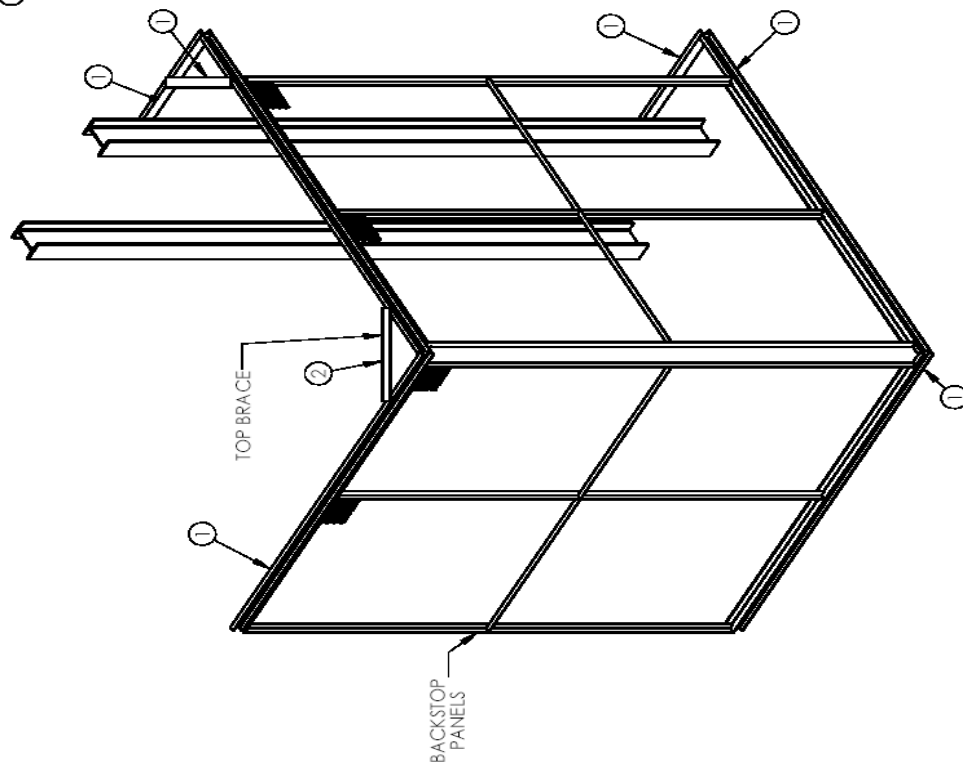
FLT BACKSTOP INSTALLATION

MATERIAL INCLUDED IN KIT:

- ① 2" X 1" CHANNEL, 102" LG, 4 PCS
2" X 1" CHANNEL, 144" LG, 2 PCS.
- ② 2" X 1/4" BAR, 156" LG, 2 PCS.

NOTES:

- NOTES:**
 A) TWO SIDED BACKSTOP SHOWN. PANELS IN FRONT OR SIDE MAY NOT BE REQUIRED.
 B) IF PANELS ARE ONLY REQUIRED ON FRONT, BRACING REMAINS THE SAME. BUT PANELS WILL NOT BE INCLUDED FOR SIDE.
 C) IF PANELS ARE ONLY REQUIRED ON SIDE, BRACING WILL NOT BE REQUIRED IN FRONT.




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Figure 25 Backstop Panel Kit (when required)

OPERATING INSTRUCTIONS



DANGER!

To avoid personal injury or death, do not operate this equipment with substandard, defective, or missing parts. Contact a local FREIGHTLITE service representative if a deficiency is found.



WARNING!

Close all gates when not in use! Never leave the FREIGHTLITE unattended with the gates left open!



WARNING!

All gates and/or doors of the FREIGHTLITE are electrically interlocked and must be closed to permit operation the lift. Do not operate unit with doors open or with the interlocks or other safety devices “defeated” (bypassed)! Serious injury or death could result.

UP

When the “UP” button is pressed, and all interlocks are closed, the coil of the motor starter (M1) will close the line contacts of M1 permitting the 3-phase electric power to be applied to the motor. The auxiliary contacts of M1 also close and act as holding contacts to maintain the UP circuit. The rotating motor shaft is mechanically coupled to a positive displacement gear pump. This pump will rotate, assuming proper motor rotation direction, and it draws oil from the reservoir. The oil is pressurized, causing flow through the check valve, and forces it out to the ram through a high pressure hose. To displace the incoming volume of oil, the ram is forced to move in an outward direction.

The direct displacement two-stage ram assembly is attached to the platform carriage and is captured in the base of the lift. One stage pushes down and the other stage pushes up causing the carriage to ascend. The platform carriage will continue to move upward as long as the motor is running. The platform carriage is guided in the two vertical masts by rollers that are captured on opposite sides of the mast flange. When the platform carriage makes contact with the upper stop bolts (or any other obstruction in the path of the carriage), the pressure switch senses an increase in pressure, which engages the holding circuit and shuts off the motor.

OPERATING INSTRUCTIONS

When the motor stops, the hydraulic oil in the system is held in place by the spring-loaded check valve that has returned to its seat, thereby blocking the backflow through the control valve. The platform carriage will maintain its position at the upper floor level.

DOWN

Pressing the DOWN push-button will cause the timer relay #1 (TR-1) to close its contacts and start the preset time out sequence. The closed contacts of TR-1 permit 115-volt control power to be applied to the down solenoid coil that is inside the control valve.

The coil causes the core plunger to move outward, allowing the down valve to open and the pressure-compensated down speed regulator to regulate the degree of the valve opening. This is dictated by the weight of the load placed on the platform carriage. The carriage will come to a stop when it reaches the lower stops or the floor level. At this point, there is no pressure remaining in the hydraulic system and there is no flow through the down valve, even though the valve remains open.

One of two things can happen at this point in the operation of the FREIGHTLITE lift.

1. The timer relay (TR01) in the system can “time-out” and allow the down valve to close, OR
2. The “UP” button can be pushed, which will interrupt the timer circuit causing the down valve to close.

Either condition will close the controlled breach in the hydraulic pressure system and pressure will be developed, which will raise the platform carriage when the motor is started.

EMERGENCY STOP

Press the red emergency stop button to stop all travel of the FREIGHTLITE at any time. After the emergency stop button has been reset, any level button may be pressed to continue travel.

The emergency stop button will interrupt all electrical control functions when it is activated. Movement of the carriage will cease, regardless of its direction.

STORAGE

When not in use, it is always best to store the unit with the carriage in the fully lowered position. This removes pressure from the hydraulic system during non-use and will extend the overall life of the components in the hydraulic system.

ROUTINE MAINTENANCE



DANGER!

To avoid personal injury or death, all maintenance procedures described in this section should only be performed by qualified service personnel.



DANGER!

To avoid personal injury or death, do not operate this equipment with substandard, defective, or missing parts. Contact a local FREIGHTLITE service representative if a deficiency is found.



WARNING!

To avoid serious injury or death, GUARDS, INTERLOCKS, and SAFETY DEVICES must be restored to correct operation when installing parts or making repairs.

MAINTENANCE SCHEDULE

USAGE	SUGGESTED MAINTENANCE INTERVALS
5 – 10 cycles per week	180 days
5 – 10 cycles per day	90 days
5 – 10 cycles per hour	30 days or as required.
** Time required to perform this maintenance is approximately 1 to 2 man-hours, plus any repairs that may be required.	

DYNAMIC INSPECTION (FREIGHTLITE running)

1. Listen for unusual noises. Isolate and check for the cause. Repair if required.
2. Check that the platform carriage is hitting the upper limit stop bolts. Make sure that the platform carriage is lined up with the upper floor. Adjust the stop bolts, if required.
3. Check the limit switch and adjust it, if needed.

ROUTINE MAINTENANCE

ROUTINE STATIC INSPECTION (FREIGHTLITE not running and fully lowered)



DANGER!

To avoid personal injury or death, before performing any of the static inspections, make sure the platform carriage is fully lowered and the power has been disconnected at the safety disconnect switch. Also, put signs at all gates, doors, controls, etc. indicating that the system is out of service for maintenance per OSHA Lock-Out, Tag-Out requirements.

1. Check for unusual wear in the guide wheels, ensure that they are free to rotate, and check that there is desirable clearance between the bearing and axle.
2. Check for broken or cracked welds.
3. Check that all anchors are in place and secure.
4. Check that all the hydraulic fittings are secure and dry.
5. Check that the cylinder is clean and un-nicked. There may be a small amount of oil accumulating near the rod clevis block and around the rod seal due to the normal wiping action of the rod wiper. Wipe the area clean.

NOTE: Do not mistake normal lubricating weeping for a leak. If oil is running down the outside of the cylinder barrel and is dripping on the floor after everything has been wiped clean during the last maintenance, there may be a rod seal or a bleed screw leak.

6. Look for any unusual rub marks on the guides, wall, platform carriage, masts, etc, which might indicate misalignment of the components due to overloading, misuse, or something out of tolerance.
7. Check that all bolts and nuts are secure.
8. Check the oil level in the power unit reservoir. The oil should be 1 ½" to 2" below the top of the tank when the FREIGHTLITE is fully lowered.

ROUTINE MAINTENANCE

9. Using a long handled broom or other implement, remove any debris from under the platform carriage or in the enclosed area.



DANGER!

Never go under a platform! To avoid personal injury or death, always be sure the load has been removed from the platform and that it has been blocked properly! See “Blocking Instructions” section.

GENERAL MAINTENANCE



WARNING!

To avoid personal injury or death, all maintenance procedures described in this section should only be performed by qualified service personnel.

OIL RECOMMENDATIONS

The FREIGHTLITE operates efficiently utilizing high quality oil products that are readily available in all areas. These oil products contain additives that are desirable for optimum performance of the equipment. Follow the recommendations below that apply to the circumstances most similar to your installation.

Environment (Ambient Temperature)	Recommended Oil
Indoor locations with variable temperatures: 30 - 100 degrees F	5W 30 or 5W 40 Multiviscosity Motor Oil
Indoor locations with constant temperatures: 60 - 80 degrees F	5W 30 or 10W 40 Multiviscosity Motor Oil
Outdoor locations: 30 - 120 degrees F	5W 30 or 10W 30 Multiviscosity Motor Oil
Outdoor locations: 0 - 30 degrees F	5W or 10W Viscosity Motor Oil
Freezing Applications (below 0 degrees F)	Contact local <i>Autoquip</i> Representative
Cold Storage Warehouse: 10 - 40 degrees F	Contact local <i>Autoquip</i> Representative

NOTE: All oils above are detergent type.



WARNING!!!

It is very important to use the proper oil in the operation of the FREIGHTLITE!!

DO NOT USE:

- Automatic Transmission Fluid (ATF)
- Hydraulic Jack Oil
- Hydraulic Fluids
- Brake Fluids

GENERAL MAINTENANCE

NOTES:

1. Industrial hydraulic oils formulated for high pressure uses and of the proper viscosity contain anti-wear, anti-foaming, anti-rust additives making them acceptable. However, it is best to contact **Autoquip** Customer Service for advance approval!
2. Use of improper oil will VOID the FREIGHTLIFT warranty!
3. The unit must be fully lowered to perform the filling operation.

FLUSHING THE HYDRAULIC SYSTEM

When the hydraulic system becomes contaminated or as a function of normal PMP (in heavy use or particularly severe applications), it may be necessary to flush the entire hydraulic system.

Parts Required:

- 5 – 10 gallons of proper oil (depends on tank size - see "Oil Recommendations")
- 1 gallon of mild cleaning solvent
- Lint free rags
- A new pump
- A new suction filter



DANGER!

Turn off power and lock-out at the primary power disconnect switch before service or maintenance. This procedure should only be done by qualified service personnel and per OSHA Lock-Out, Tag-Out requirements.

1. Lower the carriage to the floor and lock-out and tag the electrical disconnect.
2. Remove the hydraulic hoses and the pump.
3. Drain the tank and then remove the suction filter.
4. Flush the hoses with solvent and wipe out the tank with solvent.
5. Install the new suction filter and pump and install the hoses.
6. Fill the tank with fresh oil and turn on the electrical power.
7. Bleed the system of air and check for leaks (see below).

GENERAL MAINTENANCE

AIR BLEEDING PROCEDURE

1. Press the “UP” button and allow the unit to raise 10 – 12 inches. Press the emergency stop button.
2. Crack the bleed screw on top of the first stage side until clear oil (no bubbles) comes from the cracked bleed screw.
3. Tighten the screw; make sure no oil comes from the screw when it is tightened.
4. Clean up any spilled oil. Used oil should be discarded as it may contain flushed contaminants from the line.

NOTE: A small amount of air may remain in the cylinder, but it will be flushed back to the reservoir after a few operations of the system.



WARNING!

To avoid serious injury or death, GUARDS, INTERLOCKS, and SAFETY DEVICES must be restored to correct operation when installing parts or making repairs.

GENERAL MAINTENANCE

CYLINDER AND/OR SEAL REPLACEMENT

Cylinder Removal

1. While the lift is in the lowered position, remove the cap screw which holds the top cylinder rod of the double ram assembly to the carriage thrust angle at the top rear of the carriage.
2. Press the “UP” button and raise the carriage up high enough to place the maintenance blocks underneath the carriage in all four corners (see “Blocking Instructions” section).
3. Lower the carriage onto the maintenance blocks and continue to press the “DOWN” button for an additional ten seconds in order to bleed the pressure off the system.
4. Disconnect the hydraulic hose from the two rams. Drain the oil into a bucket as the cylinders retract and the oil drains from the hose.
5. If the entire ram assembly is to be replaced and the velocity fuses are to be reused, disconnect the fuses from the elbow fittings attached to the ram casings. Make note of the orientation for reinstallation. Refer to **Hydraulic Schematic**.
6. Unbolt and remove the ram stabilizer arms and wear pads (if applicable) from the double ram casing. (Stabilizers are most common with high travel units.)
7. The upper rod should have retracted from the carriage thrust angle and the double ram assembly can now be removed by lifting the bottom rod out of the socket in the mast base weldment.

Seal Replacement

1. Lay the ram assembly on its side.
2. To access the seal, push the rod down inside the casing past the seals by threading a bolt into the end of the rod and simply pushing on the bolt. Take all precautions not to scratch the cylinder rod.
3. Remove the old seal ring and backup ring. Inspect the seal groove for nicks and scratches that could affect the seal. Remove as necessary.
4. Clean the groove thoroughly and install the new seal and backup. Lubricate the seal with **clean** oil or grease.
5. Grasping the bolt in the end of the cylinder rod, pull the rod out of the casing taking precaution against pinching or tearing the seal ring.

GENERAL MAINTENANCE

Re-Installing the Cylinder

1. Reinstall the new double ram assembly by reversing the steps above.
2. Check the oil level (see “Oil Requirements” section).
3. Once the double ram assembly is in place, the stabilizers are installed, and all hydraulic connections are made tight, proceed to bleed air out of the system (see “Air Bleeding Procedure” section).
4. Clean the oil fill breather cap..
5. Clean up any debris and/or spilled oil from the area.

PIPE THREAD SEALANT

Loctite PST #567 pipe thread sealant or equivalent is recommended. **Do not use Teflon tape.** Tape fragments can cause malfunctioning of the hydraulic system.

VELOCITY FUSE REPLACEMENT



DANGER!

Do not attempt to remove the velocity fuse until the lift is securely supported with the lift blocking devices and all hydraulic pressure has been removed from the lifting cylinders and hydraulic hoses. Failure to follow these instructions could result in personal injury or death!

Never attempt to take a velocity fuse apart and repair it. These are precision devices that are factory assembled under exacting conditions. Velocity fuses should always be replaced.

1. The arrow on the exterior surface of the velocity fuse shows the direction of the restriction to the oil flow. The arrow should always point away from the cylinder.
2. **Do not use Teflon tape on the threaded connections of a velocity fuse.** Tape fragments can cause malfunctioning of the fuse.
3. Check all fitting connections for hydraulic leaks and tighten as necessary.

GENERAL MAINTENANCE

WIRING AUTOQUIP "SUPER TORQUE" MOTORS

1. The Contractor Power Unit utilizes a "Super-Torque" intermittent duty (one full lift cycle per four minute period) 5 HP/208, 230, 460 Volts/60 hertz/3 phase motor driving a high pressure positive displacement pump assembly with internal relief check and dump valves.
2. Because *Autoquip* "Super-Torque" motors actually deliver substantially more horsepower than their nameplate rating, they must always be wired for heavier current-draw than standard motors of the same nameplate rating. However, because of the "Super-Torque" motor's starting efficiency and superior running characteristics, circuit components do not have to be as large as for standard motors of equal delivered horsepower.

The following chart should be referenced in connecting these motors to power sources, remembering that heavy wire must be used all the way to the power-source.

5HP		208 Volts	230 Volts	460 volts
Full Amperages	Load	15.8	14.8	7.4



DANGER!

HIGH VOLTAGE!! – Disconnect and/or lock out the electrical supply to the power unit prior to any installation or maintenance being performed per OSHA Lock-Out, Tag-out requirements.



WARNING!

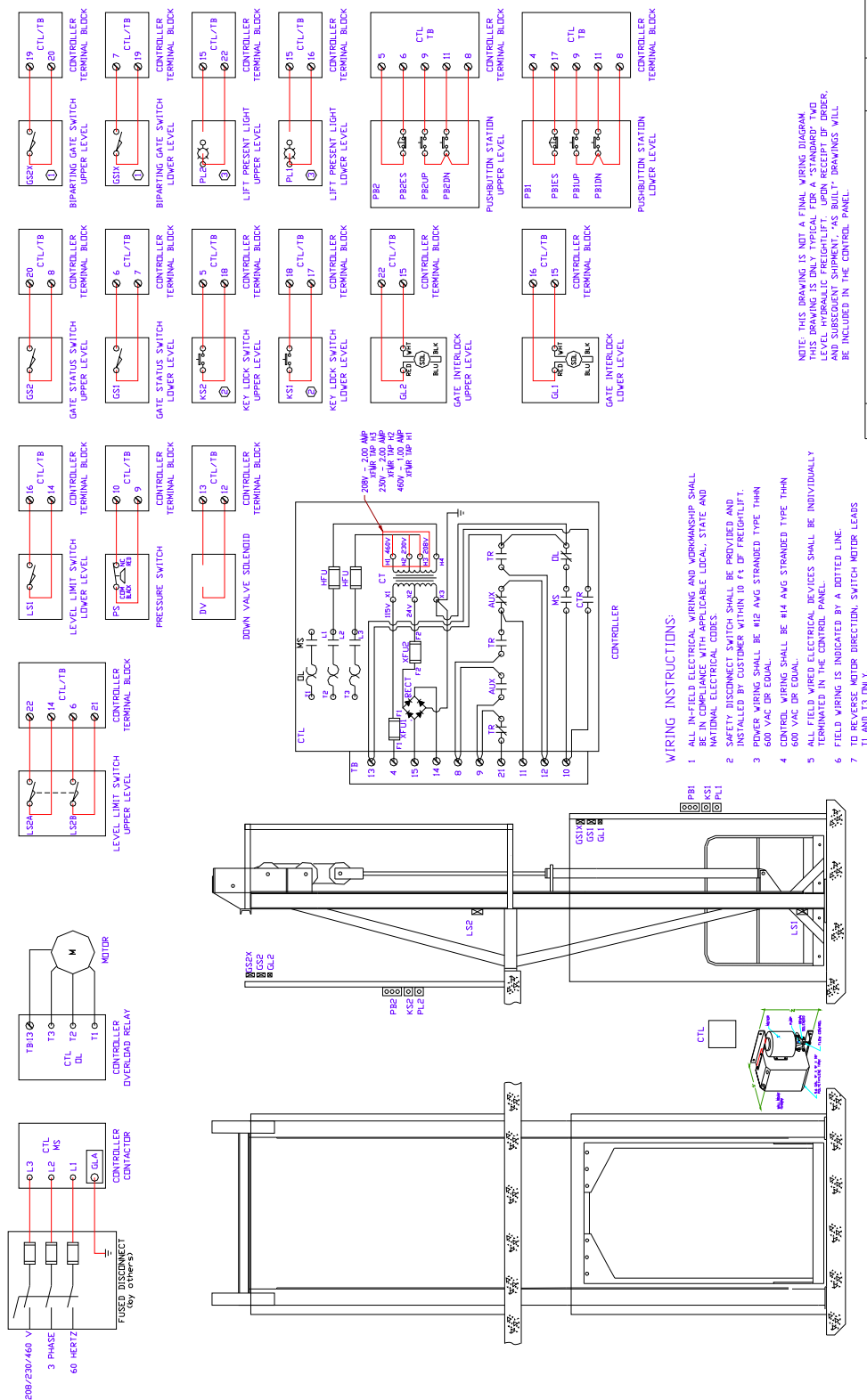
To avoid serious injury or death, GUARDS, INTERLOCKS, and SAFETY DEVICES must be restored to correct operation when installing parts or making repairs.

65815440



GENERAL MAINTENANCE

65815440



REV	DESCRIPTION	BY	DATE
1	SEE PAGE #1 FOR REVISIONS		
JOB NAME: ORDER NO:			
DRAWING TITLE: FLH(C)/FLT 2 LEVEL STD ELECTRICAL SCHEMATIC			
REFERENCE DRAWING:	DRAWN BY: SC	DATE: 6/10/94	DRAWING NUMBER: 65815440
APPROXIMATE WEIGHT:	QTY REQD: 2 OF 2	PAGE: 1	SIZE: A

Autoquip

SEE SHEET 1 OF 2 FOR
COMPONENT LAYOUTS
- ELECTRICAL SCHEMATIC
- PARTS LIST

Figure 27b FLT Generic Electrical Schematic (Sheet 2)

GENERAL MAINTENANCE

64306660 1 OF 1

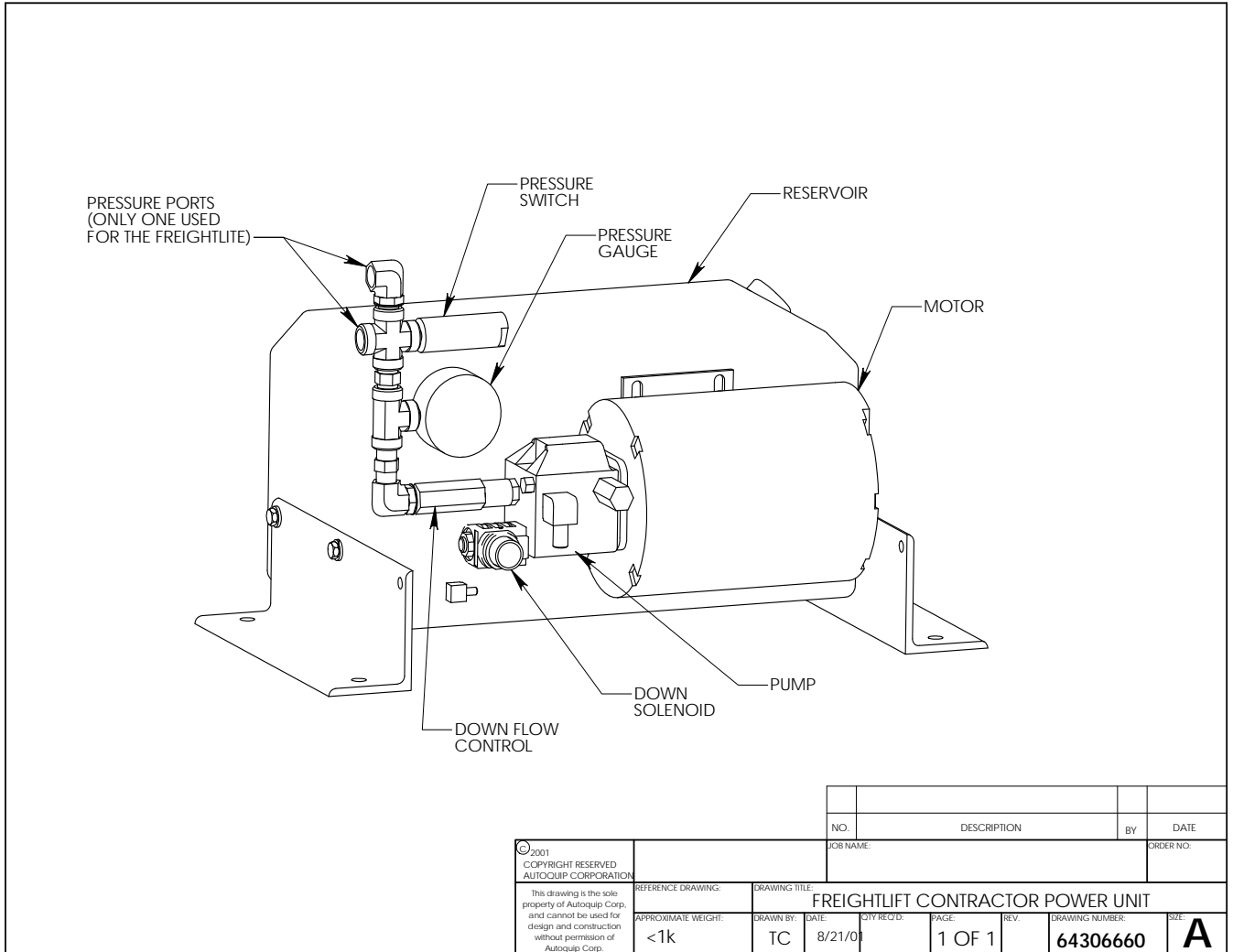


Figure 28 FLT Power Unit

REPLACEMENT PARTS LIST

Specific part numbers vary from job to job, depending on the model and options chosen for the application. Call the *Autoquip* Service Department at 888-811-9876 or 405-282-5200 with the serial number of the specific FREIGHTLIFT equipment to order the appropriate parts

PART #	DESCRIPTION
20011383	Flanged Load Runner, 2" (FLT 30)
20012800	Flanged Load Runner, 1½" (FLT 15)
30600613	Motor, 208-230v / 460v, 3ph, tang shaft
32701300	Down Solenoid, 115 vac
35103150	Limit Switch Kit, std.
35105920	Limit Switch Kit, (2) n.o. – (2) n.c. for solenoid interlocks
35107920	Control Panel, 460 vac/115 vac-24 vac, N12
35108110	Control Panel, 208-230 vac/115 vac-24 vac, N12
36301260	Pressure Switch
40200640	Pump, 1.4 gpm, tang shaft, internal relief check (FLT 15/30)
40200650	Pump, 2.8 gpm, tang shaft, internal relief check (Special - High Speed)
41050139	Suction Strainer
41502626	Flow Control Valve, 2.0 gpm (FLT 15/30)
41800384	Velocity Fuse, 4.0 gpm (FLT 15/30)
41901943	Pressure Gage
42300610	Double Ram Assembly, 1 ½" bore, low travel
42600660	Double Ram Assembly, 1 ½" bore, high travel
XXXXXX	Double Ram Assembly, 1 ¾" bore, extra high travel
45502670	Seal Kit, 1 ½" bore
XXXXXX	Seal Kit, 1 ¾" bore
46000139	Pressure hose, ¼" x 72"
46000430	Pressure hose, ¼" x 42"
46100111	Connecting Hose, 3/8" x 120"
47701640	Filler Breather
64201020	Oil Reservoir, polyethylene
65900045	Control Signal Pushbutton, "UP" / "DOWN"

TROUBLESHOOTING ANALYSIS



DANGER!

To avoid personal injury, **NEVER** go under the lift platform until it is securely blocked (See "Blocking Instructions" section) and the load is removed.

Troubleshooting and maintenance on the lift should only be performed by qualified service technicians!!

PROBLEM	POSSIBLE CAUSE AND SOLUTION
<p>Unit will not raise (motor <u>not</u> running or "humming").</p> <p>.</p>	<ul style="list-style-type: none"> • The emergency stop button may be depressed or jammed. Check all push-button stations. Repair as necessary. • The gate or door is not closed. Check and close. • The main line disconnect switch is open (off). Check and close (on). • The main distribution panel circuit breaker is tripped or a fuse is blown. Check and reset or replace as necessary. • The gate status switch or door interlock is malfunctioning or is out of tolerance. Check and repair or adjust as required. • The main line fuse disconnect fuse is blown. Check and replace. • The "UP" push button or circuit is malfunctioning. Check at the other push button station for "UP" function. Check components and circuit. Repair or replace. • The motor starter overloads (MSO) have tripped. Check and reset. If it trips again, check for cause in the motor circuit. • The control transformer fuse is blown. Check and replace. • The motor starter coil (MI) has burned out. Check and replace. (Will usually blow the control transformer fuse.)

TROUBLESHOOTING ANALYSIS

PROBLEM	POSSIBLE CAUSE AND SOLUTION
Unit does not raise (motor <u>is</u> running or humming)	<ul style="list-style-type: none"> • The load may exceed the rating. Remove the excess load. • Check for hydraulic oil leak. Correct if needed. • Check for oil shortage in the reservoir and add oil, if necessary. • Rotation on the 3-phase motor may be reversed. Reverse any two motor electrical leads. • 3-Phase motor may be single-phasing (humming). Check wiring, fuses, etc. • Breather cap on the reservoir may be clogged. Remove and clean. • Suction screen may be clogged. The screen is attached to the suction line in the tank. Remove and clean. Drain and replace oil. • Suction line may be leading air due to loose fitting, causing cavitation. Check fittings. Bleed air from the system (see Air Bleeding Procedures in the Routine Maintenance Section). • The “DOWN” valve may be energized by faulty wiring or it may be stuck in the open position. Remove the solenoid and check. • The voltage at the motor terminals may be too low to run the pump with the existing load. Check before measuring the voltage at the motor terminals (or as near as possible) while the pump is running under load. Reading the source voltage or pump idling voltage is meaningless. Inadequate or incorrect wiring can starve the motor when the source voltage is ample. Correct as necessary. • The pump may be seized if the motor is humming or blowing fuses or overloads. Remove the pump with the platform in the lowered position. The shaft should be able to be turned by hand. Check for cracks in the housing.

TROUBLESHOOTING ANALYSIS

PROBLEM	POSSIBLE CAUSE AND SOLUTION
Motor labors or heats excessively.	<ul style="list-style-type: none"> • The voltage may be low. Check at the motor terminals while the pump is running under load. Do not check at the line source or while the pump is idling. Inadequate wiring can starve the motor even when the source voltage is ample. • The wiring may be incorrect. Be sure one leg of the motor line is not connected to the ground prong. This can happen particularly on 3-phase units using twist-lock plugs. • The pump may be binding from oil starvation. This can cause high internal heat. The pump can be irreparably damaged by oil starvation and may have to be replaced.
Unit operates in a “spongy” or jerky fashion.	<ul style="list-style-type: none"> • The load may exceed the stated capacity of the unit. Overloading caused the pressure switch valve to activate and deactivate if the “UP” button is depressed. The motor may start and stop if this condition exists. Remove excess load. • The hydraulic system may have air in it. The unit requires bleeding (see Air Bleeding Procedures in the Routine Maintenance section). • Check for oil starvation. • The rollers may be binding. Check and repair. • The platform carriage may be binding in the guideways. Check and repair. • The cylinder may be binding internally or externally. Check and repair. • The pressure switch may be turning the motor on and off. Check and repair.
Motor will not turn off when lift reaches fully raised position	<ul style="list-style-type: none"> • Relief valve setting is too low and oil is flowing over relief. Need to adjust setting upward per instructions in Installation section. • Pressure switch setting is too high and oil is flowing over relief. Need to adjust downward per instructions in Installation section.

TROUBLESHOOTING ANALYSIS

<p>Unit won't lower</p> <p>- Electrical Circuit</p>	<ul style="list-style-type: none"> • The emergency stop button may be pressed or jammed Check and repair. • The gates or doors may be open. Close and try again. • Control transformer fuse may be blown. Check and replace. • Manually bleed off the hydraulic pressure with the lower valve. If the lift lowers, check the electrical circuit and the down solenoid. If the lift does not lower, see next section below. • The solenoid may be incorrectly wired, burned out, not rated for the voltage, or the line voltage may be excessively low. • The timer relay may be malfunctioning. Check and replace. • The motor starter auxiliary contacts may be malfunctioning. Check and repair.
<p>Unit won't lower</p> <p>- Hydraulic Circuit</p>	<ul style="list-style-type: none"> • Check for mechanical obstructions or a binding condition. <p>NOTE: Contact a local Autoquip Representative before attempting to repair the following problems.</p> <ul style="list-style-type: none"> • Check for tripped velocity fuses. • Air in the system will cause a lock up (see Air Bleeding Procedures in the Routine Maintenance section). • Heavy oil will cause a lockup (see Oil Recommendations in the Routine Maintenance section). • Cold temperatures of below 10 degrees F will cause a lockup (see Oil Recommendations in the Routine Maintenance section).

TROUBLESHOOTING ANALYSIS

<p>Unit lowers too slowly with a load.</p>	<ul style="list-style-type: none"> • Check for a pinched hose or tubing. • The down valve may be malfunctioning. Check and replace control valve. • The down valve solenoid mounting is loose preventing the valve from opening completely. Check and repair. • Oil is extremely heavy for the application or low temperature is causing a thickening of the oil (see Oil Recommendations in the General Maintenance section). • The down valve solenoid may be weak and not pulling in completely (it will usually chatter). Also, check the control voltage. Check and repair or replace. • Check for a partially blocked or malfunctioning flow control valve.
<p>Unit raises, then lowers back slowly.</p>	<ul style="list-style-type: none"> • The “DOWN” solenoid valve may be energized in the “open” position. Remove the solenoid coil and recheck. If the lift does not hold with the solenoid coil removed, replace the down valve cartridge. • The oil line, hose, or fitting may be leading. Check and repair. • The hydraulic cylinder rod seal may be leading. Check to see if hydraulic oil is running down the outside of the cylinder barrels at the rod end. Repair as necessary. <p>NOTE: A small amount of oil at the bottom of the rod is normal and desirable for proper lubrication of the cylinder. A lead would cause oil to flow from the rod area when the lift is in the raised position.</p>
<p>The unit does not raise completely to the upper level (press “emergency stop” button to stop motor.)</p>	<ul style="list-style-type: none"> • There is some sort of interference with the platform carriage. Check and correct. • The load exceeds the capacity of the unit. Lower the unit, unload, and try again. • The oil level in the reservoir may be too low. Check and replace. Determine cause and repair.

GLOSSARY OF TERMS

TERM	DEFINITION
Anchors	Bolts used to fix masts to the floor
ATF	Automatic transmission fluid
Back frame	The vertical portion of the carriage on the cantilever Freightlift
Cam Followers	Replaceable, high capacity, low impact rated, needle bearing rollers which run on the mast beam flanges and support the full weight of the loaded cantilever carriage.
Cantilever	A style of Freightlift where the carriage rides along two masts that are mounted on the same side of the carriage. This style of lift will accommodate all three loading patterns.
Capacity	The maximum load the Freightlift will lift
Carriage	The entire assembly that travels on the mast and carries the load
Controls	Any electrical device used in the operation of a Freightlift, which normally includes push button stations, control boxes, limit switches, interlocks, etc.
Cylinder/Ram Pair	An assembly of two opposing, direct-acting hydraulic ram-style cylinders which pushes the carriage up under hydraulic pressure, and lowers the carriage by gravity
Cycle	The lift is considered to have operated one cycle any time the motor starts.
Deltatrol	A seven-function valve block that performs the hydraulic functions Freightlifts
Down solenoid	An electrical mechanical device that, when electrically energized, opens the down valve.
Enclosure	A structure surrounding the Freightlift to prevent anything from interfering with normal operation of the lift, and to protect personnel. Typically eight-foot high panels made of expanded metal that will prevent a two-inch diameter ball from passing through. This is a requirement of the conveyor code (ANSI-B20.1)
Gate	A device that opens and closes to allow access to the carriage for loading and unloading. Normally a swing, sliding, or vertical acting device constructed of similar expanded metal as the enclosure.
Hydraulic	Operation by movement and force of high pressure liquid
Interlock	An electrical mechanical system for doors or gates to prevent operation of the lift if all the gates are not closed or if the lift platform is not level.
Limit Switch	An electrical device by which the movement of the Freightlift may be controlled within predetermined limits.
Load height	The maximum height of the material a carriage can accommodate.
Load pattern	A method to describe how a Freightlift will be loaded at different levels.
Mast Beams	The vertical members upon which the carriage is guided throughout its vertical travel.
Motor starter	An electrical controller for accelerating a motor from rest to normal speed.

GLOSSARY OF TERMS

TERM	DEFINITION
Mechanical stop	A mechanical means of stopping travel at a predetermined spot or to prevent overtravel of a lift.
Nonoperating end	The side(s) of the platform not used for loading/unloading. Handrails with midrails and kick plates are supplied as minimum safety protection.
Operating end	The side(s) of the platform used for loading/unloading. A safety chain is supplied as minimum safety protection.
Platform	The horizontal surface of the carriage where the load is placed.
Power unit	An assembly including, but not limited to the motor, pump, reservoir, and the Deltatrol valve.
Pressure relief valve	A valve that can be set to a predetermined pressure. If the pressure is exceeded, the valve will open to prevent damage to the hydraulic system.
Pressure switch	A switch that can be set to a predetermined pressure. When this pressure is reached, it will open, thus turning off the power.
Roll off panel	A structure used on the upper levels to prevent personnel/products from falling off the platform when loading.
Snap chain	A length of chain with a clasp on the end to close off the operating end of a carriage.
Straddle	A style of Freightlift in which the carriage rides between two masts that are mounted on opposite sides of the carriage. This style will accommodate both "C" and "Z" loading patterns.
Top Stop Bolts	Two adjustable bolts used to physically stop the carriage at the top of the lift travel.
VRC	Vertical reciprocating conveyor
Vertical travel	The distance from the lowest point of infeed or discharge to the highest point of infeed or discharge
Zero drift	A pressure-sensing feature that prevents the platform from drifting from an upper level.

LIMITED WARRANTY

The user is solely responsible for using this equipment in a safe manner and observing all of the safety guidelines provided in the Owner's Manual and on the warning labels provided with the lift. If you are unable to locate either the manual or the warning labels, please contact Autoquip or access www.autoquip.com for replacement downloads or information.

Autoquip Corporation expressly warrants that this product will be free from defects in material and workmanship under normal, intended use for a period of One (1) Year for all electrical, mechanical, and hydraulic components, parts or devices. Ninety (90) days Labor warranty, extended to One (1) year with a Planned Maintenance Contract in place. Autoquip Corporation also warrants the structure of the lift against breakage or failure for a period of Five (5) years. The warranty period begins from the date of shipment. When making a claim, immediately send your dealer or Autoquip notice of your claim. All claims must be received by Autoquip within the warranty time period. The maximum liability of Autoquip, under this Limited Warranty, is limited to the replacement of the equipment.

This warranty shall not apply to any Autoquip lift or parts of Autoquip lift that have been damaged or broken in transit/shipping, or due directly or indirectly to misuse, abuse, vehicle impact, negligence, faulty installation, fire, floods, acts of God, accidents, or that have been used in a manner contrary to the manufacturer's limitations or recommendations as stated in the manual, or that have been repaired, altered or modified in any manner outside of Autoquip Corp's manufacturing facility or which have not been expressly authorized by Autoquip.

Autoquip Corporation makes no warranty or representation with respect to the compliance of any equipment with state or local safety or product standard codes, and any failure to comply with such codes shall not be considered a defect of material or workmanship under this warranty. Autoquip Corporation shall not be liable for any direct or consequential damages resulting from such noncompliance.

Autoquip Corporation's obligation under this warranty is limited to the replacement or repair of defective components at its factory or another location at Autoquip Corp's discretion at no cost to the owner. This is owner's sole remedy. Replacement parts (with exception of electrical components) will be warranted for a period of ninety (90) days. Except as stated herein, Autoquip Corporation will not be liable for any loss, injury, or damage to persons or property, nor for direct, indirect, or consequential damage of any kind, resulting from failure or defective operation of said equipment. All parts used to replace defective material must be genuine Autoquip parts in order to be covered by this Limited Warranty.



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